

North Coast
Water Quality Control
Board. 1998
Material from Redwood
Creek File @ NCR WQCB,
Santa Rosa, CA.

File Contents Enclosed:
(Indexed in Master Index
SWRCB)



California Regional Water Quality Control Board

North Coast Region

Ross R. Liscum, Chairman

Winston H. Hickox
Secretary for
Environmental
Protection



Gray Davis
Governor

Internet Address: <http://www.swrcb.ca.gov>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone (707) 576-2220 FAX (707) 523-0135

November 22, 1999

Mr. Steven Horner
Barnum Timber Company
PO Box 1365
Eureka, CA 95502-1365

Dear: Mr. Horner

SUBJECT: Redwood Creek Clean Water Act 303(d) Listing

In response to your request for the basis for the Clean Water Act 303(d) listing of Redwood Creek (Humboldt County), I am pleased to provide the enclosed information. While these documents provide the administrative basis for the initial listing of Redwood Creek, it is widely recognized that information developed through reports detailing restoration and mitigation work on Redwood Creek documents in greater detail the challenges confronted in restoring the ecological integrity of the basin with respect to sediment transport. Additional insight to the federal requirement for developing total maximum daily loads may be found in Clean Water Act section 303(d)(3).

Should you have further questions on this matter, please contact me at (707) 576-2661. Thank you for your continued interest in our mission to preserve and restore the water resources of this state.

Sincerely,

Bruce Gwynne
Environmental Specialist III

BG:clh/redinfo

Enclosures:

- 1-1: USEPA October 19, 1993 letter from Harry Seraydarian to Walt Pettit.
- 1-2: September 10, 1993 Staff Report Supporting Final Action on California 303(d) List.
- 2-1: USEPA April 22, 1993 Staff Report Supporting Recommended Action on 1992 California 303(d) Lists.
- 2-2: USEPA fact sheet for Redwood Creek.
- 3-1: NCRWQCB 3/17/94 Water Body Fact Sheet for Redwood Creek.

California Environmental Protection Agency



Recycled Paper

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

75 Hawthorne Street
San Francisco, CA 94105

(In reply, refer to W-3-2)

OCT 19 1993

Mr. Walt Pettit
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

- BK _____
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Dear Mr. Pettit:

The U.S. Environmental Protection Agency has reviewed California's §303(d) waterbody lists submitted August 24, 1993. We hereby disapprove California's §303(d) list of waters needing TMDLs and establish a final list comprised of the 259 waters listed by the State and 17 additional waters which meet the listing criteria. We have discussed our proposed decision with staff at the State Board and Regional Boards, and we understand that they do not oppose this action. I would like to emphasize that the State and Regional Boards generally did an excellent job in developing the §303(d) lists, and that there are relatively few areas of disagreement. I believe that the §303(d) list will provide a useful starting point for more effective targeting of water quality protection efforts throughout California. The following sections explain our decision in greater detail.

Background

EPA partially approved California's §303(d) lists on September 24, 1992. In this action, EPA approved the listing of waters listed by the State, and requested additional information about a large number of potential candidate waters. At that time, we provided the State with the opportunity to revise the §303(d) list to include additional waters. In a letter dated October 28, 1992, the State informed EPA that California would not amend its §303(d) list at this time. However, State and Regional Board staff were very responsive in addressing EPA's requests for additional information.

From the larger list of potential listing candidates, EPA identified 17 additional waters which meet the listing criteria. In order for EPA to add waters to a State §303(d) list, we are required to first disapprove the State's decision not to list these waters, then establish a final §303(d) list containing all waters which meet the listing criteria. Today's action follows this procedure.

Public Notice and Comments

In May, 1993, EPA published a notice in the Federal Register requesting public comment on the state list and EPA's proposal to



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Staff Report Supporting Final Action
California 303(d) List

Prepared by David Smith, September 10, 1993

Pursuant to listing requirements established in Clean Water Act Section 303(d), and the Water Quality Planning and Management Regulations (40 CFR 130.7), California State Water Resources Control Board submitted listing actions to EPA for review and approval. California submitted its final Section 303(d) list on August 24, 1992. On September 24, 1992, EPA partially approved California's lists and requested additional information about a large number of potential candidate waters. In this action, EPA fully approval of California's priority list of 28 waters targeted for TMDL development in the immediate future. In a Staff Report dated April 22, 1993, EPA recommended disapproval of California's §303(d) list because California did not list 17 waters which meet the listing criteria. We recommended the approval of a list comprised of the 259 waters listed by the State and the 17 additional waters which meet the listing criteria.

Pursuant to the public participation requirements established in 40 CFR 25, EPA published a notice of availability in the Federal Register and requested public comment on EPA's proposed decisions (58 FR 92, pp. 28,569-28,571, May 14, 1992). EPA received one comment letter concerning California's §303(d) list during the 30 day comment period provided in Federal Register notice. We consulted with the Regional Water Quality Control Board in developing our response to these comments. EPA's response to issues raised in the comment letter is attached to this staff report. EPA has determined that no changes to the proposed decision are warranted in response to comments received.

The Division Director is delegated the authority to approve or disapprove Section 303(d) lists submitted by the States. When EPA disapproves a state §303(d) list, EPA is required to establish a §303(d) list for that state (40 CFR 130.7(d)). Therefore, I recommend that the Division Director disapprove California's Section 303(d) listing submittal and establish a final list comprised of the 259 waters listed by the state and the 17 additional waters identified in the April 22, 1993 staff report.

Because the State of California has already indicated its intent to develop a TMDL for Laguna de Santa Rosa during the 1992-94 period, EPA concludes that it is unnecessary to establish an enforceable schedule in order to ensure that the State develops this TMDL.

EPA and the State of California are currently reviewing progress made in developing TMDLs for the targeted high priority waterbodies. EPA expects that the State will make substantial progress in developing TMDLs for these waters over the next year, and that TMDLs will be submitted for EPA approval upon completion. If the State does not make reasonable progress in developing TMDLs for targeted waterbodies, EPA will take appropriate measures to ensure that high priority TMDLs are developed.

In conclusion, EPA agrees that a TMDL should be developed for the Laguna de Santa Rosa and concludes that the State has made a firm commitment to develop this TMDL. EPA disagrees with the request to establish a specific time line for TMDL development in this case because such a schedule is unnecessary.

- 3) A TMDL for the Lower Russian River should be accomplished by the time frame established for the Laguna de Santa Rosa TMDL.

RESPONSE: EPA concludes that there is insufficient information to support listing of the Lower Russian River on the §303(d) list (see response to comment #1). Because EPA does not intend to list the Russian River on the §303(d) list, we conclude that it is unnecessary and inappropriate to establish a schedule for TMDL development for the Russian River.

- 4) Commentor agrees that 17 rivers proposed by EPA for inclusion on the §303(d) list should be added to the list.

RESPONSE: Comment noted. EPA is adding these 17 rivers to the final §303(d) list.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION IX
 75 Hawthorne Street
 San Francisco, CA 94105

QUALITY
 CONTROL BOARD
 REGION 1

JUL 8 '93

Staff Report Supporting Recommended Action
 1992 California §303(d) Lists

Prepared by David Smith, TMDL Coordinator
 April 22, 1993

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 303(d) TMDL
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§303(d) List Submittal Recommended Decision

EPA has reviewed California's Clean Water Act §303(d) lists contained in its Section 303(d) Report dated July 1992 and submitted August 24, 1992. California lists 259 waterbodies still requiring total maximum daily loads (TMDLs) [303(d) Report, Section 2], and 28 waterbody reaches for which TMDLs will be updated or established over the next two years [303(d) Report, Section 3].

On September 24, 1992, EPA partially approved California's 303(d) list of water quality limited segments still requiring TMDLs and the list of water quality limited segments for which TMDLs will be updated or established within the next two years. California's submittal partially satisfies the listing requirements in Clean Water Act §303(d)(1)(a) and 40 CFR 130.7 because the listings of waters in the California 303(d) Report:

- are based on reasonable analysis of available information concerning State water quality conditions,
- identify many, but not all waters within State boundaries for which effluent limitations required by §301(b)(1)(a) and §301(b)(1)(b) are not stringent enough to implement applicable water quality standards, and
- establish a priority ranking for listed waters, taking into account the severity of the pollution and the uses to be made of such waters.

On September 28, 1992, EPA requested additional information regarding a large number of waterbodies which were not listed and provided the State the opportunity to amend its list to include additional waters which meet the listing criteria. In a letter dated October 28, 1992, the California Water Resources Control Board informed EPA that the State would not amend its lists at this time. Therefore, we recommend partial disapproval of the list of water quality limited segments still requiring TMDLs because California did not list 17 waters which meet the listing criteria. We recommend addition of the following waterbodies to California's list:

<u>Waterbody Name</u>	<u>Hydrologic Unit Number</u>
Garcia River	113.70
Trinity River	106.00
Gualala River	113.80
Redwood Creek	107.00
Shasta River	105.50
Scott River	105.40
Klamath River	105.00
Tomki Creek	111.62
Big River	113.30
Albion River	113.40
Van Duzen River	111.20
South Fork Trinity River	106.20
Eel River	111.00
Mad River	109.00
Mattole River	112.30
Navarro River	113.50
Noyo River	113.20

Attached to this report are fact sheets for each of these additional waters which explain the basis for adding the waterbodies to the California 303(d) list. EPA does not propose any changes to the list of waters for which TMDLs will be developed over the next two years.

Basis for List Review

EPA reviewed California's §303(d) lists by comparing them with assessments of water quality impairment found in the following documents:

- "1992 Water Quality Assessment Report (May 1992)"
- "DECISION OF USEPA ON LISTINGS UNDER SECTION 304(1) OF THE CLEAN WATER ACT REGARDING THE STATE OF CALIFORNIA," EPA Region IX, (September 28, 1990),
- Assorted documents which are cited in the attached waterbody fact sheets.
- "Nonpoint Source Assessment Report" (August, 1989)

EPA's analysis indicates that the State has listed most, but not all documented impaired waters as water quality limited segments requiring TMDLs. The list of waters targeted for TMDL development within the next two years appears to be reasonable. Therefore, EPA concludes that California has partially met its 303(d) listing obligations.

Based on its review of 1992 Water Quality Assessment and the other sources listed above, EPA identified additional waters as possible candidates for 303(d) listing. EPA requested and received assistance from Regional Water Quality Control Board staff in

further evaluating these additional waters and identifying additional sources of information about these waters. Regional Water Quality Control Board staff provided explanations of the State decisions not to list most of the waters identified by EPA as possible candidate waters. The Administrative Record contains letters from two Regional Boards and notes from telephone conversations with staff from 6 Regional Boards which describe the basis for these State decisions.

EPA believes that the Water Quality Assessment alone provides insufficient information to determine whether waterbodies should be listed on the 303(d) list. Therefore, EPA proposes to add to the California 303(d) list only those waters for which multiple sources of information are available to support a finding that a segment is water quality limited (i.e., effluent limitations required by §301(b)(1)(a) and §301(b)(1)(b) are not stringent enough to implement applicable water quality standards. Based on its review of readily available information about possible candidate waterbodies listed in EPA's letter dated September 28, 1992, EPA is proposing to add 17 waters to the California 303(d) list. See the attached fact sheets for specific information concerning each of these waterbodies.

Next Steps

California provided adequate opportunity for public participation in the development of its 303(d) Report (see 303(d) Report, p. 2 for details concerning public participation activities). EPA is proposing to add waters to the California 303(d) list and must provide adequate opportunity for the public to review and comment on this proposed decision (40 CFR 25). Therefore, EPA will publish a notice in the Federal Register inviting public comment on the proposal to add waters to California's 303(d) list. A 30 day comment period will be provided. EPA will consider comments received from the public in its final decision and will produce a document which explains EPA's responses to public comments. EPA will consult with California Water Resources Control Board and Regional Water Quality Control Boards in its consideration of public comments. EPA Region 9 expects to reach a final decision on California's list in June 1993.

303(d) FACT SHEET

WATER BODY NAME: Redwood Creek

LOCATION BY HYDROLOGIC UNIT NO.: 107.00 Source to Mouth

BASIS FOR LISTING:

Redwood Creek aquatic habitat is impaired by excessive sediment loading caused by historic logging activity (Water Quality Fact Sheet). Anadromous fish populations have experienced significant declines in Redwood Creek, partly as a result of fisheries habitat degradation (American Fisheries Society report, March 29, 1992, Page 3 and Water Quality Fact Sheet).

Date: 03/17/94

WATER BODY FACT SHEET

Region: 1

Water Body Name: REDWOOD CREEK

Hydrologic Unit No.: 107.00

Total Areal Extent: 63 MI

Type of Resource: Rivers and Streams

Clean Water Strategy Rating

Resource Value: 3

Uniqueness: 4

Magnitude of Use: 3

SUMMARY OF PROBLEM(S) OR CONCERN(S)

Type of Problem/Need: SEDIMENTATION FROM NATURAL AND HUMAN SOURCES HAS IMPACTED BENEFICIAL USES.

Location: SOURCE TO MOUTH

Problem/Need(s) and Source Description: REDWOOD CREEK, PARTIALLY PROTECTED BY REDWOOD NATIONAL PARK, IS THE DOMESTIC WATER SUPPLY FOR THE COMMUNITY OF ORICK, AND SUPPORTS AN ANADROMOUS SALMONID FISHERY. HISTORIC LOGGING UPSTREAM OF THE PARK HAS RESULTED IN NPS SEDIMENTATION. FISH POPULATIONS HAVE DECLINED.

	Concern 1	Concern 2	Concern 3
Specific Location:	ORICK	: MULTIPLE AREAS	:
Type of Pollutants/Parameters:	SED, DEB, NUT SUS	: SED, DEB, HAB	:
Method of Assessment:	Best Professional Judgement	: Best Professional Judgement	:
Water Quality Impaired or Threatened?:	Threatened - 3	: Threatened - 3	:
Major Beneficial Use Category Affected:	Recreational	: Aquatic	:
Type of Source(s):	INDU	: SILV, RANG, ONPS	:
Areal Extent:	1e MI	: 63e MI	:
Programs Affected:	NPDES, WDRNON15, WQC-PLAN, UGT	: NPS, MONITOR, UNREG, WQC-PLAN	:

	Concern 4	Concern 5	Concern 6
Specific Location:	:	:	:
Type of Pollutants/Parameters:	:	:	:
Method of Assessment:	:	:	:
Water Quality Impaired or Threatened?:	:	:	:
Major Beneficial Use Category Affected:	:	:	:
Type of Source(s):	:	:	:
Areal Extent:	:	:	:
Programs Affected:	:	:	:

e = areal extent of problem is estimated

Date Last Updated: 12/05/90



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

NORTH COAST REGION

OCT 12 '99

8 October 1999

C. Robert Barnum
Barnum Timber Company
P.O. Box 1365
Eureka, CA 95502-1365

- LM
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 - CJ
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 - ALL STAFF
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Dear Mr. Barnum:

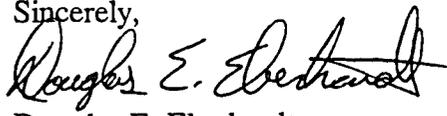
Thank you for your inquiry to Dave Smith regarding the listing of Redwood Creek as impaired pursuant to Section 303(d) of the Clean Water Act. I have been asked to respond to your letter. One reason why you may have had difficulty determining listing requirements is because EPA has recently proposed significant changes to the regulations that implement Section 303(d). This letter addresses certain aspects of the current and proposed rules.

In accordance with Section 303(d), states decide whether to list waters as impaired. The North Coast Regional Water Quality Control (Regional Water Board) makes the listing decisions for Redwood Creek. They are required to review and update the 303(d) list every two years. The next update is due to EPA on 1 April 2000, but this deadline may be extended, because the proposed amendments to the regulations would change listing requirements.

The proposed amendments also address the issue of removing a water from the 303(d) list. Currently, states can remove a water from the list once a TMDL has been established. EPA is proposing to change this by requiring that waters with TMDLs be placed on a separate portion of the list until the waters actually attain the applicable water quality standards.

EPA is soliciting comments on the proposed regulations. The comment period has been extended to 22 December 1999. The proposal and a description of the procedures for submitting comments are available on the EPA web page (<http://www.epa.gov/owow/tmdl>).

The requirements for the next update of the 303(d) list are uncertain, because of the proposed amendments to the regulations, but I hope this at least clarifies the situation. If you have any questions, please contact me at 415-744-1280. You may also wish to contact Bruce Gwynne of the Regional Water Board at 707-576-2661 regarding issues related to the 303(d) list for the North Coast Region and Redwood Creek.

Sincerely,

Douglas E. Eberhardt
Coordinator, Forest Ecosystem Initiative

cc: Bruce Gwynne, Regional Water Board



Peter M. Rooney
Secretary for
Environmental
Protection

California Regional Water Quality Control Board

North Coast Region

Internet Address: <http://www.swrcb.ca.gov>
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone (707) 576-2220 • FAX (707) 523-0135



Pete Wilson
Governor

August 11, 1998

Mr. Charles Ciancio
P.O. Box 172
Cutten, CA 95534

SUBJECT: Redwood Creek Clean Water Act 303(d) Listing

Dear :Mr. Ciancio

In response to your request for the documents providing the basis for the Clean Water Act 303(d) listing of Redwood Creek, I am pleased to provide the enclosed information. While these documents provide the administrative basis for the initial listing of Redwood Creek, it is widely recognized that information developed by Redwood State and National Parks documents in greater detail the challenges confronted in restoring the ecological integrity of the basin with respect to sediment transport. Additional insight to the federal requirement for developing total maximum daily loads may be found in Clean Water Act section 303(d)(3).

Should you have further questions on this matter, please contact me at (707)576-2661. Thank you for your continued interest in our mission to preserve and restore the water resources of this state.

Sincerely,

Bruce Gwynne
Environmental Specialist
North Coast Regional Water Quality Control Board

Enclosures:

- 1-2: USEPA October 19, 1993 letter from Harry Seraydarian to Walt Pettit, with September 10, 1993 Staff Report Supporting Final Action on California 303(d) List
- 2-2: USEPA April 22, 1993 Staff Report Supporting Recommended Action on 1992 California 303(d) Lists, with USEPA fact sheet for Redwood Creek

California Environmental Protection Agency

Mr. Charles Claudio
8/11/98

WATER QUALITY
CONTROL BOARD
REGION 1

NOV 4 '93



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

75 Hawthorne Street
San Francisco, CA 94105

(In reply, refer to W-3-2).

OCT 19 1993

Mr. Walt Pettit
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Mr. Pettit:

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The U.S. Environmental Protection Agency has reviewed California's §303(d) waterbody lists submitted August 24, 1993. We hereby disapprove California's §303(d) list of waters needing TMDLs and establish a final list comprised of the 259 waters listed by the State and 17 additional waters which meet the listing criteria. We have discussed our proposed decision with staff at the State Board and Regional Boards, and we understand that they do not oppose this action. I would like to emphasize that the State and Regional Boards generally did an excellent job in developing the §303(d) lists, and that there are relatively few areas of disagreement. I believe that the §303(d) list will provide a useful starting point for more effective targeting of water quality protection efforts throughout California. The following sections explain our decision in greater detail.

Background

EPA partially approved California's §303(d) lists on September 24, 1992. In this action, EPA approved the listing of waters listed by the State, and requested additional information about a large number of potential candidate waters. At that time, we provided the State with the opportunity to revise the §303(d) list to include additional waters. In a letter dated October 28, 1992, the State informed EPA that California would not amend its §303(d) list at this time. However, State and Regional Board staff were very responsive in addressing EPA's requests for additional information.

From the larger list of potential listing candidates, EPA identified 17 additional waters which meet the listing criteria. In order for EPA to add waters to a State §303(d) list, we are required to first disapprove the State's decision not to list these waters, then establish a final §303(d) list containing all waters which meet the listing criteria. Today's action follows this procedure.

Public Notice and Comments

In May, 1993, EPA published a notice in the Federal Register requesting public comment on the state list and EPA's proposal to

add 17 waters. A copy of our final staff report and responses to public comments are attached for your review. No changes in EPA's proposed decision were made in response to public comments.

Today's Action

The list we are establishing today includes all the waters listed by the State and the following 17 waters:

<u>Waterbody Name</u>	<u>Hydrologic Unit Number</u>	<u>Pollutant(s)</u>
Garcia River	113.70	sediments
Trinity River	106.00	sediment, temperature
Gualala River	113.80	sediment
Redwood Creek	107.00	sediment
Shasta River	105.50	dissolved oxygen
Scott River	105.40	sediment
Klamath River	105.00	temperature, nutrients
Tomki Creek	111.62	sediment
Big River	113.30	sediment
Albion River	113.40	sediment
Van Duzen River	111.20	sediment
S. Fork Trinity River	105.20 - 106.20	sediment
Eel River	111.00	sediment, temperature
Mad River	109.00	sediment, turbidity
Mattole River	112.30	sediment, temperature
Navarro River	113.50	sediment
Noyo River	113.20	sediment

In the September 24th action, EPA fully approved California's list of highest priority waters targeted for TMDL development in the next two years. Today's action does not affect our prior approval of the priority list.

We appreciate the California's efforts to address the §303(d) listing requirements in a thorough and timely manner, and we look forward to working with the State to make the TMDL process an effective part of your water quality management program. If you have any questions concerning this action, please call me at (415) 744-2125 or ask your staff to call David Smith at (415) 744-2019.

Sincerely,


for Harry Seraydarian
Director
Water Management Division

enclosures

cc: Michael Perrone, Division of Water Quality
John Norton, Division of Water Quality
Bob Klamt, North Coast Regional Water Quality Control Board



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Staff Report Supporting Final Action
California 303(d) List

Prepared by David Smith, September 10, 1993

Pursuant to listing requirements established in Clean Water Act Section 303(d), and the Water Quality Planning and Management Regulations (40 CFR 130.7), California State Water Resources Control Board submitted listing actions to EPA for review and approval. California submitted its final Section 303(d) list on August 24, 1992. On September 24, 1992, EPA partially approved California's lists and requested additional information about a large number of potential candidate waters. In this action, EPA fully approval of California's priority list of 28 waters targeted for TMDL development in the immediate future. In a Staff Report dated April 22, 1993, EPA recommended disapproval of California's §303(d) list because California did not list 17 waters which meet the listing criteria. We recommended the approval of a list comprised of the 259 waters listed by the State and the 17 additional waters which meet the listing criteria.

Pursuant to the public participation requirements established in 40 CFR 25, EPA published a notice of availability in the Federal Register and requested public comment on EPA's proposed decisions (58 FR 92, pp. 28,569-28,571, May 14, 1992). EPA received one comment letter concerning California's §303(d) list during the 30 day comment period provided in Federal Register notice. We consulted with the Regional Water Quality Control Board in developing our response to these comments. EPA's response to issues raised in the comment letter is attached to this staff report. EPA has determined that no changes to the proposed decision are warranted in response to comments received.

The Division Director is delegated the authority to approve or disapprove Section 303(d) lists submitted by the States. When EPA disapproves a state §303(d) list, EPA is required to establish a §303(d) list for that state (40 CFR 130.7(d)). Therefore, I recommend that the Division Director disapprove California's Section 303(d) listing submittal and establish a final list comprised of the 259 waters listed by the state and the 17 additional waters identified in the April 22, 1993 staff report.

Response to Comments: California §303(d) List

CONCERNS: RUSSIAN RIVER, LAGUNA DE SANTA ROSA
Comment #1: Russian River Watershed Protection Committee

- 1) The Lower Russian River is water quality limited and should be added to the §303(d) list.

Response: The Section 303(d) listing includes the identification and prioritization of waters which are not meeting or are not expected to attain water quality standards, and the identification of the pollutants causing or expected to cause violation of standards [40 CFR 130.7(b)(1)]. The Regional Water Quality Control Board evaluated the Russian River when the §303(d) lists were being developed, and concluded that the River is not impaired. EPA requested that the Regional Board review its assessment of the Russian River, and the Regional Board reiterated its findings.

In order for EPA to add the Russian River to the §303(d) list, additional information would have to be submitted which demonstrates that the Russian River is impaired. In requesting that the Russian River be added to the list, the commentor provided information about alleged water quality problems affecting the River. However, this information fails to support conclusive findings that Russian River standards are not being met. Therefore, EPA concludes that there is insufficient information to support listing of the Russian River on the §303(d) list.

EPA agrees that there is a need for more thorough assessment of water quality conditions in the Russian River. EPA is working with the State Water Resources Control Board and Regional Water Quality Control Board to focus additional monitoring and assessment resources on the Russian River and its tributaries in the future.

- 2: A TMDL for Laguna de Santa Rosa must be prepared pursuant to an enforceable time line of not more than one year.

Response: The State of California listed the Laguna de Santa Rosa on its 1992 §303(d) list as one of its highest priority waters. The State has initiated development of TMDL action plans for the Laguna de Santa Rosa and 27 other high priority waters.

Federal regulations require each state to (1) establish priority rankings for waters identified on the §303(d) list, and (2) specifically identify waters targeted for TMDL development in the next two years [40 CFR 130.7(b)(4)]. The State of California identified the Laguna de Santa Rosa as a waterbody targeted for TMDL development in the two year period following the listing process. EPA approved California's §303(d) listing and priority ranking of Laguna de Santa Rosa on September 24, 1992. Therefore, EPA expects that the State will develop a TMDL for the Laguna de Santa Rosa within two years of that date.

Because the State of California has already indicated its intent to develop a TMDL for Laguna de Santa Rosa during the 1992-94 period, EPA concludes that it is unnecessary to establish an enforceable schedule in order to ensure that the State develops this TMDL.

EPA and the State of California are currently reviewing progress made in developing TMDLs for the targeted high priority waterbodies. EPA expects that the State will make substantial progress in developing TMDLs for these waters over the next year, and that TMDLs will be submitted for EPA approval upon completion. If the State does not make reasonable progress in developing TMDLs for targeted waterbodies, EPA will take appropriate measures to ensure that high priority TMDLs are developed.

In conclusion, EPA agrees that a TMDL should be developed for the Laguna de Santa Rosa and concludes that the State has made a firm commitment to develop this TMDL. EPA disagrees with the request to establish a specific time line for TMDL development in this case because such a schedule is unnecessary.

- 3) A TMDL for the Lower Russian River should be accomplished by the time frame established for the Laguna de Santa Rosa TMDL.

RESPONSE: EPA concludes that there is insufficient information to support listing of the Lower Russian River on the §303(d) list (see response to comment #1). Because EPA does not intend to list the Russian River on the §303(d) list, we conclude that it is unnecessary and inappropriate to establish a schedule for TMDL development for the Russian River.

- 4) Commentor agrees that 17 rivers proposed by EPA for inclusion on the §303(d) list should be added to the list.

RESPONSE: Comment noted. EPA is adding these 17 rivers to the final §303(d) list.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Staff Report Supporting Recommended Action
1992 California §303(d) Lists

Prepared by David Smith, TMDL Coordinator
April 22, 1993

§303(d) List Submittal Recommended Decision

EPA has reviewed California's Clean Water Act §303(d) lists contained in its Section 303(d) Report dated July 1992 and submitted August 24, 1992. California lists 259 waterbodies still requiring total maximum daily loads (TMDLs) [303(d) Report, Section 2], and 28 waterbody reaches for which TMDLs will be updated or established over the next two years [303(d) Report, Section 3].

On September 24, 1992, EPA partially approved California's 303(d) list of water quality limited segments still requiring TMDLs and the list of water quality limited segments for which TMDLs will be updated or established within the next two years. California's submittal partially satisfies the listing requirements in Clean Water Act §303(d)(1)(a) and 40 CFR 130.7 because the listings of waters in the California 303(d) Report:

- are based on reasonable analysis of available information concerning State water quality conditions,
- identify many, but not all waters within State boundaries for which effluent limitations required by §301(b)(1)(a) and §301(b)(1)(b) are not stringent enough to implement applicable water quality standards, and
- establish a priority ranking for listed waters, taking into account the severity of the pollution and the uses to be made of such waters.

On September 28, 1992, EPA requested additional information regarding a large number of waterbodies which were not listed and provided the State the opportunity to amend its list to include additional waters which meet the listing criteria. In a letter dated October 28, 1992, the California Water Resources Control Board informed EPA that the State would not amend its lists at this time. Therefore, we recommend partial disapproval of the list of water quality limited segments still requiring TMDLs because California did not list 17 waters which meet the listing criteria. We recommend addition of the following waterbodies to California's list:

<u>Waterbody Name</u>	<u>Hydrologic Unit Number</u>
Garcia River	113.70
Trinity River	106.00
Gualala River	113.80
Redwood Creek	107.00
Shasta River	105.50
Scott River	105.40
Klamath River	105.00
Tomki Creek	111.62
Big River	113.30
Albion River	113.40
Van Duzen River	111.20
South Fork Trinity River	106.20
Eel River	111.00
Mad River	109.00
Mattole River	112.30
Navarro River	113.50
Noyo River	113.20

Attached to this report are fact sheets for each of these additional waters which explain the basis for adding the waterbodies to the California 303(d) list. EPA does not propose any changes to the list of waters for which TMDLs will be developed over the next two years.

Basis for List Review

EPA reviewed California's §303(d) lists by comparing them with assessments of water quality impairment found in the following documents:

- "1992 Water Quality Assessment Report (May 1992)"
- "DECISION OF USEPA ON LISTINGS UNDER SECTION 304(1) OF THE CLEAN WATER ACT REGARDING THE STATE OF CALIFORNIA," EPA Region IX, (September 28, 1990),
- Assorted documents which are cited in the attached waterbody fact sheets.
- "Nonpoint Source Assessment Report" (August, 1989)

EPA's analysis indicates that the State has listed most, but not all documented impaired waters as water quality limited segments requiring TMDLs. The list of waters targeted for TMDL development within the next two years appears to be reasonable. Therefore, EPA concludes that California has partially met its 303(d) listing obligations.

Based on its review of 1992 Water Quality Assessment and the other sources listed above, EPA identified additional waters as possible candidates for 303(d) listing. EPA requested and received assistance from Regional Water Quality Control Board staff in

further evaluating these additional waters and identifying additional sources of information about these waters. Regional Water Quality Control Board staff provided explanations of the State decisions not to list most of the waters identified by EPA as possible candidate waters. The Administrative Record contains letters from two Regional Boards and notes from telephone conversations with staff from 6 Regional Boards which describe the basis for these State decisions.

EPA believes that the Water Quality Assessment alone provides insufficient information to determine whether waterbodies should be listed on the 303(d) list. Therefore, EPA proposes to add to the California 303(d) list only those waters for which multiple sources of information are available to support a finding that a segment is water quality limited (i.e., effluent limitations required by §301(b)(1)(a) and §301(b)(1)(b) are not stringent enough to implement applicable water quality standards. Based on its review of readily available information about possible candidate waterbodies listed in EPA's letter dated September 28, 1992, EPA is proposing to add 17 waters to the California 303(d) list. See the attached fact sheets for specific information concerning each of these waterbodies.

Next Steps

California provided adequate opportunity for public participation in the development of its 303(d) Report (see 303(d) Report, p. 2 for details concerning public participation activities). EPA is proposing to add waters to the California 303(d) list and must provide adequate opportunity for the public to review and comment on this proposed decision (40 CFR 25). Therefore, EPA will publish a notice in the Federal Register inviting public comment on the proposal to add waters to California's 303(d) list. A 30 day comment period will be provided. EPA will consider comments received from the public in its final decision and will produce a document which explains EPA's responses to public comments. EPA will consult with California Water Resources Control Board and Regional Water Quality Control Boards in its consideration of public comments. EPA Region 9 expects to reach a final decision on California's list in June 1993.

303(d) FACT SHEET

WATER BODY NAME: Redwood Creek

LOCATION BY HYDROLOGIC UNIT NO.: 107.00 Source to Mouth

BASIS FOR LISTING:

Redwood Creek aquatic habitat is impaired by excessive sediment loading caused by historic logging activity (Water Quality Fact Sheet). Anadromous fish populations have experienced significant declines in Redwood Creek, partly as a result of fisheries habitat degradation (American Fisheries Society report, March 29, 1992, Page 3 and Water Quality Fact Sheet).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Staff Report Supporting Recommended Action
1992 California §303(d) Lists

Prepared by David Smith, TMDL Coordinator
April 22, 1993

~~0111034~~
~~000000~~

§303(d) List Submittal Recommended Decision

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~~0111034~~

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Based on its review of 1992 Water Quality Assessment and the other sources listed above, EPA identified additional waters as possible candidates for 303(d) listing. EPA requested and received assistance from Regional Water Quality Control Board staff in

further evaluating these additional waters and identifying additional sources of information about these waters. Regional Water Quality Control Board staff provided explanations of the State decisions not to list most of the waters identified by EPA as possible candidate waters. The Administrative Record contains letters from two Regional Boards and notes from telephone conversations with staff from 6 Regional Boards which describe the basis for these State decisions.

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001201

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303(d) FACT SHEET

WATER BODY NAME: Garcia River

LOCATION BY HYDROLOGIC UNIT NO.: 113.70 Source to Mouth

BASIS FOR LISTING:

The Garcia River fisheries and aquatic habitat are impaired by excessive sediment loading and percent fines associated with historic logging and gravel mining. (Water Quality Fact Sheet and September 21, 1992 letter from Charles S. Greene, California Regional Water Quality Control Board North Coast Region to Bryan Gaynor). As a result, anadromous fisheries in the Garcia River have fallen to critically low levels (American Fisheries Society Report, March 29, 1992, p. 3).

001202

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303(d) FACT SHEET

WATER BODY NAME: Trinity River

LOCATION BY HYDROLOGIC UNIT NO.: 106.00 Lewiston Dam to Mouth

BASIS FOR LISTING:

Trinity River fisheries habitat is severely impaired due to excessive sediment discharges, high water temperatures, and flow diversions (Water Quality Fact Sheet; January 24, 1990 letter from Wayne S. White, Fish and Wildlife Service to Dr. Robin Pinion of the State Water Resources Control Board; and American Fisheries Society report, March 29, 1992, Page 6). Fish populations in the Trinity River have experienced substantial decreases due to these factors (Water Quality Fact Sheet).

001883

303(d) FACT SHEET

WATER BODY NAME: Gualala River

LOCATION BY HYDROLOGIC UNIT NO.: 113.80 Source to Mouth

BASIS FOR LISTING:

The Gualala River is impaired by sedimentation and associated loss of fisheries habitat from logging, road building, and overgrazing (Water Quality Fact Sheet).

There is documentation of decreased fish populations in the Gualala River (American Fisheries Society report, March 29, 1992, Page 3 and Water Quality Fact Sheet).

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303(d) FACT SHEET

WATER BODY NAME: Redwood Creek

LOCATION BY HYDROLOGIC UNIT NO.: 107.00 Source to Mouth

BASIS FOR LISTING:

Redwood Creek aquatic habitat is impaired by excessive sediment loading caused by historic logging activity (Water Quality Fact Sheet). Anadromous fish populations have experienced significant declines in Redwood Creek, partly as a result of fisheries habitat degradation (American Fisheries Society report, March 29, 1992, Page 3 and Water Quality Fact Sheet).

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303(d) FACT SHEET

WATER BODY NAME: Shasta River

LOCATION BY HYDROLOGIC UNIT NO.: 105.50 Dwinnell Res. to Mouth

BASIS FOR LISTING:

The Shasta River is impaired due to low dissolved oxygen levels and loss of fisheries habitat associated with agricultural runoff and water diversions (Water Quality Fact Sheet; January 22, 1990 memo from Banky E. Curtis, Department of Fish and Game Region 1 to Dr. Robin Pinion, State Water Resources Control Board and American Fisheries Society report, March 29, 1992, Page 7). As a result, fish populations have fallen to critically low levels (American Fisheries Society report, March 29, 1992, Page 3).

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303(d) FACT SHEET

WATER BODY NAME: Scott River

LOCATION BY HYDROLOGIC UNIT NO.: 105.40 Source to Mouth

BASIS FOR LISTING:

The Scott River is impaired by sediment discharges from logging areas, flow depletion from agricultural diversions in Scott Valley, and loss of fisheries habitat. (Water Quality Fact Sheet; January 24, 1990 letter from Wayne S. White, Fish and Wildlife Service to Dr. Robin Pinion of the State Water Resources Control Board; American Fisheries Society report, March 29, 1992, Page 5, and January 22, 1990 memo from Banky E. Curtis, Department of Fish and Game Region 1 to Dr. Robin Pinion, State Water Resources Control Board).

As a result, fish populations in the Scott River have fallen to critically low levels (American Fisheries Society report, March 29, 1992, Page 3).

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303(d) FACT SHEET

WATER BODY NAME: Klamath River

LOCATION BY HYDROLOGIC UNIT NO.: 105.00 Source to Mouth

BASIS FOR LISTING:

Klamath River aquatic habitat is impaired due to excessively warm water temperatures and algae blooms associated with high nutrient loads, water impoundments, and agricultural water diversions. (Water Quality Fact Sheets; January 24, 1990 letter from Wayne S. White, Fish and Wildlife Service to Dr. Robin Pinion of the State Water Resources Control Board and American Fisheries Society report, March 29, 1992, Page 5). As a result, anadromous fish populations in the Klamath River system have fallen to critically low levels (American Fisheries Society report, March 29, 1992, Page 3).

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303(d) FACT SHEET

WATER BODY NAME: Tomki Creek

LOCATION BY HYDROLOGIC UNIT NO.: 111.62 Source to Mouth

BASIS FOR LISTING:

Tomki Creek fisheries habitat is impaired due to sediment discharges associated with logging, grazing, and subdivision developments (January 26, 1990 memo from Brian Hunter, Department of Fish and Game to Dr. Robin Pinion, State Water Resources Control Board and Exhibit "B" to Water Resources Control Board Nonpoint Source Grant Contract No. 0-134-110-0).

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303(d) FACT SHEET

WATER BODY NAME: Big River

LOCATION BY HYDROLOGIC UNIT NO.: 113.30 Source to Mouth

BASIS FOR LISTING:

Big River aquatic habitat is impaired due to excessive sediment and debris loadings associated with historic logging activity (Water Quality Fact Sheets and January 26, 1990 memo from Brian Hunter, Department of Fish and Game to Dr. Robin Pinion, State Water Resources Control Board). Fish populations have fallen to levels of concern as a result (Water Quality Fact Sheet).

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303(d) FACT SHEET

WATER BODY NAME: Albion River

LOCATION BY HYDROLOGIC UNIT NO.: 113.40 Source to Mouth

BASIS FOR LISTING:

Albion River aquatic habitat is impaired due to excessive sediment and debris loadings associated with historic logging activity (Water Quality Fact Sheet and January 26, 1990 memo from Brian Hunter, Department of Fish and Game to Dr. Robin Pinion, State Water Resources Control Board). Fish populations have fallen to levels of concern as a result (Water Quality Fact Sheet).

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303(d) FACT SHEET

WATER BODY NAME: Van Duzen River

LOCATION BY HYDROLOGIC UNIT NO.: 111.20 Source to Mouth

BASIS FOR LISTING:

Van Duzen River fisheries and aquatic habitat are impaired by excessive sediment loading associated with historic logging and overgrazing. (Water Quality Fact Sheets and January 24, 1990 letter to Dr. Robin Pinion of the State Water Resources Control Board from Wayne S. White, U.S. Fish and Wildlife Service). As a result, anadromous fisheries in the Van Duzen River have fallen to critically low levels (American Fisheries Society Report, March 29, 1992).

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303(d) FACT SHEET

WATER BODY NAME: Trinity River, South Fork

LOCATION BY HYDROLOGIC UNIT NO.: 106.20 Source to Mouth

BASIS FOR LISTING:

Aquatic habitat in the South Fork of the Trinity River is impaired by excessive sediment loadings associated with historic logging activities. (Water Quality Fact Sheet and January 24, 1990 letter from Wayne S. White, Fish and Wildlife Service to Dr. Robin Pinion of the State Water Resources Control Board). As a result, anadromous fisheries in the South Fork of the Trinity River have fallen to critically low levels (American Fisheries Society Report, March 29, 1992, p. 6).

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303(d) FACT SHEET

WATER BODY NAME: Eel River

LOCATION BY HYDROLOGIC UNIT NO.: 111.00 Source to Mouth

BASIS FOR LISTING:

Eel River fisheries habitat is impaired due to excessive sediment loading associated with historic logging and grazing activities (Water Quality Fact Sheets and American Fisheries Society report, March 29, 1992, Page 5). In addition, water temperatures are often too high to support healthy salmonid populations due to out-of-basin water transfers (January 24, 1990 letter from Wayne S. White, Fish and Wildlife Service to Dr. Robin Pinion of the State Water Resources Control Board and American Fisheries Society report, March 29, 1992, Page 6).

As a result, fish populations have fallen to critically low levels (Water Quality Fact Sheet and American Fisheries Society report, March 29, 1992, Page 3).

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303(d) FACT SHEET

WATER BODY NAME: Mad River

LOCATION BY HYDROLOGIC UNIT NO.: 109.00 Source to Mouth

BASIS FOR LISTING:

Mad River fisheries and aquatic habitat are impaired by excessive sediment loading associated with historic logging, overgrazing and road building. (American Fisheries Society report, March 29, 1992, Page 6; Mad River Erosion Investigation, June 1982; and January 24, 1990 letter from Dr. Robin Pinion, State Water Resources Control Board to Patrick Higgins, Humboldt American Fisheries Society).

In addition, logging and gravel mining in the Mad River appear to be causing excessively high turbidity levels (Water Quality Fact Sheet and June 1982 Mad River Erosion Investigation).

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303(d) FACT SHEET

WATER BODY NAME: Mattole River

LOCATION BY HYDROLOGIC UNIT NO.: 112.3, Source to Mouth

BASIS FOR LISTING:

Mattole River fisheries and aquatic habitat are severely impaired due to excessive sediment loading associated with historic logging and grazing activity and natural erosion. (June 13, 1990 memo from Banky E. Curtis, Regional Manager, Department of Fish and Game Region 1 to William Imboden, Chief California Department of Forestry and Fire Protection Region 1; Water Body Fact Sheet; American Fisheries Society Report, March 29, 1992, Pages 4,5); and January 24, 1990 memo to Dr. Robin Pinion of the State Water Resources Control Board from Wayne S. White, U.S. Fish and Wildlife Service).

In addition, temperatures in the Mattole River are too warm to support healthy salmonid populations (chinook and coho salmon). (June 13, 1990 memo from Banky E. Curtis, Regional Manager, Department of Fish and Game Region 1 to William Imboden, Chief California Department of Forestry and Fire Protection Region 1).

As a result, fish populations in the Mattole River have fallen to critically low levels. (Water Body Fact Sheet and American Fisheries Society, March 29, 1992, Page 3).

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303(d) FACT SHEET

WATER BODY NAME: Navarro River

LOCATION BY HYDROLOGIC UNIT NO.: 113.50, Source to Mouth

BASIS FOR LISTING:

Navarro River fisheries and aquatic habitat are impaired by excessive sediment loading from historic logging and road building. (Water Quality Fact Sheet and January 24, 1990 letter to Dr. Robin Pinion of the State Water Resources Control Board from Wayne S. White, U.S. Fish and Wildlife Service. As a result, anadromous fisheries in the Navarro River have fallen to critically low levels (American Fisheries Society Report, March 29, 1992, p. 3).

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303(d) FACT SHEET

WATER BODY NAME: Noyo River

LOCATION BY HYDROLOGIC UNIT NO.: 113.20, Source to Mouth

BASIS FOR LISTING:

Noyo River fisheries and aquatic habitat are impaired by excessive sediment loading associated with historic logging, overgrazing and road building. (Water Quality Fact Sheet and (January 24, 1990 letter to Dr. Robin Pinion of the State Water Resources Control Board from Wayne S. White, U.S. Fish and Wildlife Service). As a result, anadromous fisheries in the Noyo River have fallen to critically low levels (American Fisheries Society Report, March 29, 1992).

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**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
NORTH COAST REGION**5550 SKYLANE BLVD. SUITE A
SANTA ROSA, CA 95403
PHONE: (707) 576-2220④
LSG
030738

September 21, 1992

Mr. Bryan Gaynor
P.O. Box 4174
Arcata, CA 95521

Dear Mr. Gaynor:

We have received and reviewed your letter of August 14, 1992, containing the substitute language for the first full paragraph at the top of page 9 of the "R&J's Long Term Timber Management Plan". These two paragraphs satisfy the concerns that I expressed in my letter of December 19, 1991. However, the last sentence in the first paragraph raises yet another concern. This sentence states "During this period approximately 78% of the watershed has been subject to ongoing timber operations."

The last Annual Survey to measure physical changes in stream bed composition and morphology took place in the summer of 1991. This survey measured potential effects of logging on the stream through the fall of 1990. THP 1-88-680 MEN for 760 acres of shelterwood, removal step, was started and completed in 1991. Other areas were being logged in 1991 and were not completed until this summer (1992). The point is that the area logged or even subject to ongoing logging prior to and evaluated by the Annual Surveys through the summer of 1991 was significantly less than 78% of the watershed. Your proposed sentence can be construed to mean that 78% of a watershed can be logged within a short period of time without impact on associated watercourses. We do not agree with this and it certainly cannot be supported by monitoring data from the No. Fk. Garcia River.

I am not suggesting that the logging since 1990 has significantly impacted the stream. Jack Monschke, Bob Klant and I walked the watercourse this summer (1992) and observed no significant changes from last summer (1991) that could be attributed to logging. For this reason we did not carry out an Annual Survey this summer.

I had not considered the above concern when I talked with you by phone and indicated that the replacement paragraphs had eliminate our earlier concerns. To state that the conclusions based on hard data obtained from the Annual Surveys reflect the potential impacts of logging on 78% of the watershed is incorrect.

Along with your letter you sent Jack Monschke's Summary Report and Jan Derksen's two reports. We have reviewed these reports and have the following comments on Jack's report.

1. Page 1, paragraph 2. The text of the nonconurrence letter (presumably my letter of April 7, 1989) has been interpreted to state "the RWQCB staff believed basin standards would be violated." It is not our practice to draw such absolute conclusions without the aid of hard data upon which it can be based. In the subject letter I wrote "The short term, 3 to 5 year, discharge from these plans into the waters of the state clearly threaten to violate the prohibitions of the Regional Board's Basin Plan."

2. Page 1, paragraph 4. "It was R&J's position that the nature of its harvest plans, i.e., a selective cut averaging ...". To the best of my recollection, all R&J THPs filed on the No. Fk. Garcia were for the shelterwood, removal step, silviculture method.
3. Page 4, McNeil Sediment Data. The statistical analyses of the data are good and the conclusions agree with our own analyses and conclusions. However, these conclusions should be considered in light of several important points.

First, it is important to remember that this monitoring program has been conducted in the midst of a drought period. We have not seen heavy rainfall on saturated soils as would occur under more typical conditions. However, we have seen infrequent, yet heavy, rainfall occur following dry periods which should have flushed the No. Fk. Garcia without introducing much new sediment. We have eye witness testimony to this effect by a prominent member of FROG (Richard King, personal communication) for the main Garcia River. We would like to see a significant rainfall of a 10 year to 25 year return period which could mobilize sediments before any conclusions are made on the impact of logging on the stream channel.

Second, the percent fines (particles less than 4.7 mm in this case) is quite high at all five stations for all three surveys. The three year average is approximately 38%, 33%, 38%, 47% and 50% fines for stations 1 through 5, respectively. The optimum range of 25% to 30% quoted for Scott Downie is at the high end of the optimum range, at best, based on the literature. The sediments of this watercourse did and still do contain sufficiently high percentages of fines to seriously impair successful spawning by salmonid fishes.

Third, the percent fines found in 1991 are essentially the same as those found in 1989. The repair of preexisting, sediment producing problems areas in the watershed should along with the flushing action of recent winter storms result in a reduction in fine sediment especially at stations higher in the watershed. However, all stations except No. 1 have shown an upward trend, though not significant, in percent fines through the sampling period. While logging has not resulted in a significant increase in percent fines, the repair work, etc. has not resulted in an apparent reduction in percent fines. It appears that a zero net discharge has been achieved at this time.

Last, but not least, it is important to remember that, while replication within samples at each station is good, the number of samples (3 years worth) is quite small for drawing valid statistical conclusions on effects through time.

4. Page 6, Section III, A through E. It would be helpful if specific examples could be provided for each of these efforts. Regional Board staff cannot recall good examples for each of this efforts in the No. Fk. Garcia River. Again, while some of the harvesting may have been "selective" the prescription was shelterwood, removal step (see B of Section III).

Mr. Bryan Gaynor
September 21, 1992
Page 3

030740

We concur with Jack's recommendations for modification to the monitoring program and look forward to working with Jack or whoever is assigned this task. We do feel that a monitoring program for the No. Fk. Garcia should be continued. Additionally, we would recommend that the door be left open for possible future replication of selected, streamlined Annual Survey monitoring procedures.

Please consider the above comments for modification of the substituted paragraphs as well as for Jack's report if they are to be distributed out-of-house. If you wish to discuss any of the above comments, please contact me or Frank Reichmuth.

Sincerely,



Charles S. Greene
Sanitary Engineering Associate

CSG:lmf/gaynor

cc: Jack Monschke Watershed Management
P.O. Box 500
Miranda, CA 95553

(53) a

Memorandum

Dr. Robin Pinion
Division of Water Quality
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Date : January 26, 1990

From : Department of Fish and Game

Subject : Response to the Proposed 1990 Water Quality Assessment (WQA)

Attached are lists of waters in Lake, Mendocino, Sonoma, Marin, Napa, Solano, Alameda, and Contra Costa counties that are impaired from non-point sources of pollution which should be considered for inclusion in the WQA. Included are sources of the pollution and parameter affected. Copies of these data were faxed to Mr. William Mortensen, January 26, 1990.

C. J. Hunter
For Brian Hunter
Regional Manager
Region 3

Attachments

cc: Mr. William Mortensen

*River Creeks
not listed
DF Co suggested
impaired*

(53) a

Memorandum

~~000046~~

Dr. Robin Pinion
Division of Water Quality
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Date : January 26, 1990

From : Department of Fish and Game

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C. J. [Signature]
For Brian Hunter
Regional Manager
Region 3

Attachments

cc: Mr. William Mortensen

030753

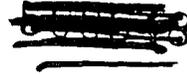
WATERBODIES IMPAIRED FROM
NONPOINT SOURCE POLLUTION
SONOMA COUNTY



	NAME	SOURCE PARAMETER	C	M	S	M	B	R
			O	I	P	A	I	A
			L	G	W	R	O	R
1 ✓	LAGUNA DE SANTA ROSA	AGAN ^{TEM} AMM, DOX, SED	X	X			X	X
	LAGUNA DE SANTA ROSA	AGDA TEM, AMM, DOX, SED	X	X			X	X
FWS	LAGUNA DE SANTA ROSA	AGGR "	X	X			X	X
	LAGUNA DE SANTA ROSA	AGRU "	X	X			X	X
	LAGUNA DE SANTA ROSA	CONS SED, HAB	X	X			X	X
	LAGUNA DE SANTA ROSA	DRED TEM, AMM, DOX, SED	X	X			X	X
	LAGUNA DE SANTA ROSA	HABI TEM, DOX, SED	X	X			X	X
	LAGUNA DE SANTA ROSA	URBA PET, HER	X	X			X	X
2 ✓	PETALUMA RIVER	AGDA TEM, AMM, DOX, SED	X	X	X	X	X	X
	PETALUMA RIVER	AGGR "	X	X	X	X	X	X
FWS	PETALUMA RIVER	AGRU "	X	X	X	X	X	X
	PETALUMA RIVER	BOAT COL, DEB, PET	X	X	X	X	X	X
	PETALUMA RIVER	CONS SED, HAB	X	X	X	X	X	X
	PETALUMA RIVER	DRED TEM, DOX, SED	X	X	X	X	X	X
	PETALUMA RIVER	HABI TEM, DOX, SED	X	X	X	X	X	X
	PETALUMA RIVER	INDU PET, DEB, HAB	X	X	X	X	X	X
	PETALUMA RIVER	URBA PET, HER	X	X	X	X	X	X
	WINDSOR CREEK	AGAN TEM, AMM, DOX, SED	X	X	X			
	WINDSOR CREEK	AGGR "	X	X	X			
	WINDSOR CREEK	AGRU "	X	X	X			
	WINDSOR CREEK	CHAN SED, HAB, TEM, FLO	X	X	X			
	WINDSOR CREEK	CONS SED, HAB	X	X	X			
	WINDSOR CREEK	HABI TEM, DOX, SED	X	X	X			
	MARK WEST CREEK	AGRU TEM, AMM, DOX, SED	X	X	X			
1	MARK WEST CREEK	AGGR "	X	X	X			
	MARK WEST CREEK	CHAN SED, HAB, TEM, FLO	X	X	X			
	MARK WEST CREEK	CONS SED, HAB	X	X	X			
1	BIG SULPHUR CREEK	GEOT AMM, DEB, FLO, HAB	X	X	X			
	SONOMA CREEK	AGAE PES	X	X	X			
2	SONOMA CREEK	AGGR TEM, DOX, SED	X	X	X			X
	SONOMA CREEK	AGRU "	X	X	X			X
	SONOMA CREEK	CHAN SED, HAB, TEM, FLO	X	X	X			X
	SONOMA CREEK	DIRE PES	X	X	X			X
1 ✓	ESTERO AMERICANO	AGDA TEM, DOX, SED, AMM	X	X	X	X	X	X
	ESTERO AMERICANO	AGGR "	X	X	X	X	X	X
FWS	ESTERO AMERICANO	AGRU "	X	X	X	X	X	X
	ESTERO AMERICANO	CHAN SED, HAB	X	X	X	X	X	X
	SANTA ROSA CREEK	DIRE PES	X	X	X			
1	SANTA ROSA CREEK	DRED TEM, DOX, SED	X	X	X			
	SANTA ROSA CREEK	DIST HAB, FLO, TEM	X	X	X			
	SANTA ROSA CREEK	HABI TEM, SED	X	X	X			

WATERBODIES IMPAIRED FROM
NONPOINT SOURCE POLLUTION
MARIN COUNTY

030754



NAME	SOURCE PARAMETER	C	M	S	M	B	R	W
		O	I	P	A	I	A	A
		L	G	W	R	O	R	R
✓ TOMALES BAY	AGDA TEM, AMM, DOX, SED	X	X	X	X	X	X	X
2 ✓ TOMALES BAY	AGGR "	X	X	X	X	X	X	X
TOMALES BAY	AGRU "	X	X	X	X	X	X	X
TOMALES BAY	CHAN SED, HAB	X	X	X	X	X	X	X
✓ WALKER CREEK	AGGR TEM, DOX, SED	X	X	X	X	X	X	X
2 ✓ WALKER CREEK	AGRU "	X	X	X	X	X	X	X
WALKER CREEK	CHAN SED, HAB	X	X	X	X	X	X	X
WALKER CREEK	DIST HAB, TEM	X	X	X	X	X	X	X
LAGUNITAS CREEK	AGDA TEM, DOX, SED	X	X	X				X
✓ LAGUNITAS CREEK	AGGR "	X	X	X				X
LAGUNITAS CREEK	AGRU "	X	X	X				X
FWS ✓ LAGUNITAS CREEK	CHAN SED, HAB	X	X	X				X
LAGUNITAS CREEK	CONS SED, HAB	X	X	X				X
LAGUNITAS CREEK	DIST SED, HAB	X	X	X				X
NICASIO RESERVOIR	AGGR TEM, DOX, SED				X			X
2 NICASIO RESERVOIR	AGRU TEM, SED				X			X
NICASIO RESERVOIR	CHAN SED, HAB				X			X
DRAKES ESTERO	AGGR TEM, SED				X	X		
2 DRAKES ESTERO	AGRU "				X	X		

030756

~~030756~~
May 4, 1989

3

Memorandum

To: John Emig, Associate Fishery Biologist

From: Frank Gray, Yountville

707-944-5532

Subject: Response to SCS request for impaired streams.

In response to your request of April 10, 1989, I am providing you with a list of streams in my unit which I know to be impaired from nonpoint sources of pollution:

I am relisting some of the habitats (e.g. Lake Berryessa) that were provided to us by the SCS, in that this list does not include some of the biological impacts associated with water quality.

These comments deal mostly with impacts from sediment, which is my primary concern.

<u>Napa County</u>			
Name	Source	Parameter	Nonpoint Sources
5 Swartz Creek	AGRU,	SED, FLO	SPWN, WIL, COLD
2 Dry Creek	HABI	HAB	
2 Dry Creek	AGRU,	SED	SPWN, WIL, MIGR, COLD, AGR
2 Rector Creek	AGRU	SED	SPWN, WILD, COLD, AGR
5 Lake Berryessa	NATU,	AGRU , TRA	
	BOAT	DIS	
	NATU,	MET	
2 Huichica Cr.	AGDA	NUT	RARE, COLD, SPWN, MIGR, AGR, WILD
	AGRU	SED	"
	CHAN	SED	"
2 Carneros Cr.	AGGR	SED	WARM, WILD, MIGR, WILD
2 Sulphur Cr.	AGGR	SED	COLD, MIGR, SPWN, AGR
FWS Napa R.	DRED	146	SPW, WILD, SAL, RARE

<u>Solano County</u>			
Name	Source	Parameter	Nonpoint Sources
2 Lake Herman	AGGR	SED	
2 Ledgewood Cr.	AGGR	SED	COLD, SPWN, MIGR,
1 Green Valley Cr.	AGGR	SED	WARM, SPWN
2 Lake Madigan	AGGR	SED	SPWN, WARM

<u>Alameda County</u>			
Name	Source	Parameter	Nonpoint Sources
L. Temescal	CONS	SED	
San Leandro Bay	INDU	DUMP	SHELL, SAL, REC-1, WILD, COMM
Alameda Cr.	AGGR	SED	COLD, SPWN

FWS
San Leandro Bay
SF Bay

030757

Contra Costa County

<u>Name</u>	<u>Source</u>	<u>Parameter</u>	<u>Nonpoint Sources</u>
San Pablo Res. ²	CONS	SED	
Wildcat Cr. ²	CONS	SED, FLO	WARM, WILD
Upper San Leandro Res. ²	CONS	SED	SPWN, COLD, WILD
Walnut Cr. ²	CONS	SED, FLO	WARM, WILD
Pinole Cr. ²	AGGR	SED	SPWN, WILD
Los Trampas, Cr.	CONS	SED	WARM, WILD

Frank Gray
Fishery Biologist
Region 3

Memorandum

030731

~~00513~~

39

Dr. Robin Pinion
 Division of Water Quality
 State Water Resources Control Board
 P. O. Box 100
 Sacramento, CA 95801

Date : January 22, 1990

From : Department of Fish and Game - Region 1
 601 Locust Street, Redding, CA 96001

Subject : Comments on Proposed 1990 Water Quality Assessment

Pursuant to a request from Mr. William Mortensen, of your staff, attached is a list of impaired water bodies within Fish and Game Region 1 which are unable, for at least part of the year, to support fish populations. These particular waters are not impaired by pollution, per se, but rather by excessive diversions which deplete the amount of water to such a degree that aquatic resources are lost because of thermal impacts (too hot) or simply not enough living space. The identified waters are listed alphabetically by regional board number.

Because of the limited time available to respond to this request, the attached list is not necessarily complete, and the estimate of affected stream lengths is just that, an estimate. Every adjudicated stream should be considered to be impaired because of a general failure to include consideration of instream flow needs in past adjudications. If you like, we would be pleased to develop a more comprehensive and accurate list for future reference.

Please contact staff biologist David Hoopaugh at (ATSS 442-2373) if you have any questions.

Redwood Creeks
 not listed

for *John M. Hayes*
 Banky E. Curtis
 Regional Manager

DFG - impaired
 info to H₂O

Memorandum

030731

~~500512~~

39

Dr. Robin Pinion
Division of Water Quality
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Date : January 22, 1990

From : Department of Fish and Game - Region 1
601 Locust Street, Redding, CA 96001

Subject: Comments on Proposed 1990 Water Quality Assessment

Pursuant to a request from Mr. William Mortensen, of your staff, attached is a list of impaired water bodies within Fish and Game Region 1 which are unable, for at least part of the year, to support fish populations. These particular waters are not impaired by pollution, per se, but rather by excessive diversions which deplete the amount of water to such a degree that aquatic resources are lost because of thermal impacts (too hot) or simply not enough living space. The identified waters are listed alphabetically by regional board number.

Because of the limited time available to respond to this request, the attached list is not necessarily complete, and the estimate of affected stream lengths is just that, an estimate. Every adjudicated stream should be considered to be impaired because of a general failure to include consideration of instream flow needs in past adjudications. If you like, we would be pleased to develop a more comprehensive and accurate list for future reference.

Please contact staff biologist David Hoopaugh at (ATSS 442-2373) if you have any questions.

for *John M. Hayes*
Banky E. Curtis
Regional Manager

030732

Waters Impaired by Flow Depletions
in
Department of Fish and Game Region 1

~~000511~~

Region 1

- Big Cr., trib. Hayfork Cr., Trinity Co., 1 mi.
- ✓ Cold Cr., trib. Bogus Cr., Siskiyou Co., 2 mi.
- Cottonwood Cr., trib. Klamath R., Siskiyou Co., 2 mi.
- Etna Cr., trib. Scott R., Siskiyou Co., 2 mi.
- French Cr., trib. Scott R., Siskiyou Co., 2 mi.
- Gilbert Cr., trib. Pacific Ocean, Del Norte Co., 2 mi.
- Hayfork Cr., trib. S.F. Trinity R., Trinity Co., 2 mi.
- Kidder Cr., trib. Scott R., Siskiyou Co., 2 mi.
- Little Shasta R., trib. Shasta R., Siskiyou Co., 15 mi.
- Luffenholtz Cr., trib. Pacific Ocean, 2 mi.
- Mill Cr., trib. Pacific O., Humboldt Co., 1 mi.
- Mill Cr., trib. Scott R., Siskiyou Co., 2 mi.
- Peacock Cr., trib. Pacific Ocean, Del Norte Co., 2 mi.
- Rowdy Cr., trib. Smith R., Del Norte Co., 1 mi.
- FWS Scott R., trib. Klamath R., Siskiyou Co., 20 mi.
- Shackleford Cr., trib. Scott R., Siskiyou Co., 3 mi.
- FWS Shasta R., trib. Klamath R., Siskiyou Co., 30 mi.
- Wildcat Cr., trib. Scott R., Siskiyou Co., 2 mi.
- Willow Cr., trib. Klamath R., Siskiyou Co., 15 mi.
- Yreka Cr., trib. Shasta R., Siskiyou Co., 2 mi.

~~030733~~Region 5

Antelope Cr., trib. Sacramento R., Tehama Co., 10 mi.
 Atkins Cr., trib. Cow Cr., Shasta Co., 2 mi.

Bailey Cr., trib. Battle Cr., Shasta Co., 8 mi.

Bear Cr., trib. Sacramento R., Shasta Co., 6 mi.

Burney Cr., trib. Pit R., Shasta Co., 15 mi.

Clear Cr., trib. Sacramento R., Shasta Co., 15 mi.

FWS Cow Cr., trib. Sacramento R., Shasta Co., 28 mi.

FWS Deer Cr., trib. Sacramento R., Tehama Co., 10 mi.

Digger Cr., trib. Battle Cr., Tehama Co., 3 mi.

Hat Cr., trib. Pit R., Shasta Co., 15 mi.

✓ Little Cow Cr., trib. Cow Cr., Shasta Co., 15 mi.

FWS Mill Cr., trib. Sacramento R., Tehama Co., 10 mi.

FWS Pit R., trib. Shasta Lake; Lassen, Modoc and Shasta Cos.;
 125 mi.

Region 6

Baxter Cr., trib. Honey L., Lassen Co., 12 mi.

Cedar Cr., trib. Pit R., Lassen and Modoc Cos., 9 mi.

Long Valley Cr., trib. Honey Lake, Lassen and Plumas Cos.
 45 mi.

✓ Susan R., trib. Honey Lake, Lassen Co., 25 mi.

Willow Cr., trib. Susan R., Lassen Co., 12 mi.

(65)

Memorandum

030759

Dr. Robin Pinion
Division of Water Quality
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Date : February 26, 1990

~~030759~~

From : Department of Fish and Game - Region 2

Subject: List of Impaired Water Bodies for the Updated Water Quality Assessment

The Department of Fish and Game (DFG) has reviewed the subject document and has the following list (attached) of waters which in our best professional judgement, aquatic resource habitat has been impaired. Due to the short review period this list is not all inclusive. It is our understanding that the purpose of this plan is to identify water bodies which are impaired by factors other than specific chemical constituents.

If we can be of further assistance, please contact Mr. John Nelson, Associate Water Quality Biologist, or Mr. Jerry Mensch, Environmental Services Supervisor, telephone (916) 355-7030.

James D. Messersmith
Regional Manager

cc: B. Mortensen, Division of Water Quality
U.S. Fish and Wildlife Service, Sacramento
Regional Admin. EPA, San Francisco

*Rind Creek
not listed*

*DFG suggestion
for impaired*

Memorandum

030759

(65)

Dr. Robin Pinion
Division of Water Quality
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Date : February 26, 1990

From : Department of Fish and Game - Region 2

Subject : List of Impaired Water Bodies for the Updated Water Quality Assessment

The Department of Fish and Game (DFG) has reviewed the subject document and has the following list (attached) of waters which in our best professional judgement, aquatic resource habitat has been impaired. Due to the short review period this list is not all inclusive. It is our understanding that the purpose of this plan is to identify water bodies which are impaired by factors other than specific chemical constituents.

If we can be of further assistance, please contact Mr. John Nelson, Associate Water Quality Biologist, or Mr. Jerry Mensch, Environmental Services Supervisor, telephone (916) 355-7030.



James D. Messersmith
Regional Manager

cc: B. Mortensen, Division of Water Quality
U.S. Fish and Wildlife Service, Sacramento
Regional Admin. EPA, San Francisco

030760

Water

Problem(s)^{1/}

Source or Cause

ALPINE COUNTY

Grass Lake Creek 6	SS,HA	Winter road maintenance.
✓ Leviathan Creek 6	CP	Leviathan mine.
✓ Bryant Creek 6	CP	Leviathan mine.
✓ East Carson River 6	CP	Leviathan mine.
Red Cascade Creek 6	T	Water diversion.
Pleasant Valley Creek 6	T,RV	Herbicide use on riparian.
East Carson River 6	T	Water diversion.
✓ West Carson River 6	T,RV	Water diversion, herbicide use on riparian.
Heenan Lake 6	Low Winter Lake Level	Water diversion.

BUTTE COUNTY

WS Butte Creek	Flows,SR,T	Water diversions & impoundments. Gravel extraction operations.
WS Lower Feather River	SR	Oroville Dam.

GLENN COUNTY

Stony Creek 5	Flow,T,SS,SR	Black Butte Reservoir gravel extraction operations, water diversions.
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NEVADA COUNTY

WS Deer Creek	T,SS,SR,RH,RV,CP	City of Nevada City, Lake Wildwood, urbanization.
Wolf Creek 5	T,SS,SR,RH,RV,CP	City of Grass Valley, Cal-Trans, Urbanization.
WS Bear River	T,SS,SR,RH,HA	Water diversions by NID & others, lake of pines sewage plant.
Yuba River, S.F. 5	T,RH,H,A,RV,CP	Water diversions by NID, sewage problems, urbanization.
Greenhorn Creek 5	T,SR,RH,HA	Mining operations, gravel operations.
✓ Humbug Creek 5	SS,RH,CP	Runoff from mining sites including Malakoff Diggins Park.

Grizzly Creek S	T,SS,RV	Development & urbanization, pond input, logging.
Canyon Creek S	T,RH,HA	Massive water diversions by NID.
Fall Creek S	T,RH,HA	Massive water diversions by NID.
Trap Creek S	T,RH,HA	Massive water diversions by NID.
Rucker Creek S	T,RH,HA	Massive water diversions by NID.
Clear Creek S	T,RH,HA	Massive water diversions by NID.
Lindsey Creek S	T,RH,HA	Massive water diversions by NID.
Yuba River, M.F. S	T,SS,RH,HA,RV	Water Diversions by NID mining and logging.
Oregon Creek S	T,SS,SR,RH,HA,RV	Mining and logging operations.
East Fork Creek S	T,SS,RH,HA,RV	Powerline construction, logging & mining operations.
Toms Creek S	T,SS,RH,HA,RV	Powerline construction, logging & mining operations.
Fordyce Creek S	SS,RH,HA	Logging activity, road construction.
Spring Creek S	T,SS,RH,HA,RV	Mining, logging, road building.
Rock Creek S	T,SS,RH,HA,RV	Extensive logging (USFS), impoundments enroute.
Squirrel Creek S	T,SS,SR,RH,HA,RV	Diversions, gravel extraction, mining, urbanization.
Cherry Creek S	T,SS,RH,HA,RV,CP	Massive urbanization along creek, ponds & leech fields.
Little Wolf Creek S	T,RH,HA	Massive diversions & urbanizations, dried up by NID at certain times.
Lake Wildwood S	T,SS,RH,RV,CP	Housing development, sewage spills.
Lake Vera S	T,SS,RH,HA,RV	Upstream development, logging, urbanization at lake.
Lake Combie S	T,SS,RH,HA,RV,CP	Massive water diversion by NID, upstream urbanization.
Magnolia Creek S	T,RV,CP	Sewage treatment plant corridor to Bear River (LOP).

Lake Spaulding 5	CP	Road salt input From I-80, Cal-Trans.
Phoenix Lake 5	CP	Highly acidified PH 4.0 lake from old mine portal (CV). *
Truckee River 6	SS,SR,HA Inadequate Flows	Unstable watershed, winter road maintenance, Sierra Pacific Power water diversions.
Donner Lake 6	SS	Winter road maintenance.
Donner Creek 6	Flows	Lake drawdown by Sierra Pacific Power.
Prosser Reservoir 6	T	Water releases.
Boca Reservoir 6	T	Water releases.
Little Truckee River 6 (Below Stampede Res.)	Flows	Water diversion (releases).
<u>PLACER COUNTY</u>		
Rock Creek 5	T,SS,RH,HA,RV	Water diversions by NID & Placer Co. W.A. urbanization along corridor.
Miners Ravine Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.
Pleasant Grove Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.
Coon Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.
Auburn Ravine Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage Treatment & construction problems. Poor planning.
Doty Ravine Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.
Secret Ravine Creek 5	T,SS,RH,HA,RV,CP	Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.

Clover Valley Creek § T,SS,RH,HA,RV,CP

Massive diversions and water shifting. Placer Co. W.A. Extensive urbanization and development. Sewage treatment & construction problems. Poor planning.

Shirttail Canyon Creek § T,SS,RH,HA,RV

Extensive mining, road building & logging operations. Mostly on private land, but increasing on USFS. Streamside urbanization.

Humbug Canyon Creek § T,SS,RH,HA,RV

Extensive mining, road building & logging operations. Mostly on private land, but increasing on USFS. Streamside urbanization.

Devils Canyon Creek § T,SS,RH,HA,RV

Extensive mining, road building & logging operations. Mostly on private land, but increasing on USFS. Streamside urbanization.

Grizzly Canyon Creek § T,SS,RH,HA,RV

Extensive mining, road building & logging operations. Mostly on private land, but increasing on USFS. Streamside urbanization.

Duncan Canyon Creek § T,SS,RH,HA,RV

Extensive mining, road building & logging operations. Mostly on private land, but increasing on USFS. Streamside urbanization.

WNS Bear River T,SS,SR,RH,HA,RV

Massive water diversions, gravel operations, urbanization of area.

Pole Creek § SS,HA

Landslide.

Squaw Creek § SS,HA

Development.

PILLIMAS COUNTY

Warner Creek § T,RH,HA,RV,BE

Grazing.

Benner Creek § T,RH,HA,RV,BE

Grazing.

Mud Creek § T,RH,HA,RV,BE

Grazing.

Last Chance Creek § T,RH,HA,RV,BE

Grazing.

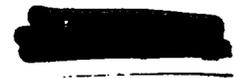
Hamilton Branch § T

PG&E control dam upstream.

Wolf Creek § T,RH,HA,RV,BE

Unknown.

Indian Creek S	T,RH,HA,RV,BE	Unstable watershed, grazing.
FWS N.F. Feather River	T,RH,HA,RV,BE,SS,SR, Flow Reduction	Grazing, unstable watershed. PG&E power dams & Army Corps flood control dam.
E.B.N.F. Feather River S	T,RH,HA,RV,BE,SS,SR	Unstable watershed.
Yellow Creek S	RH,HA,RV,BE,SS	Logging & grazing.
Big Grizzly Creek S	RH,HA,RV,BE,SS	Grazing.
Freeman Creek S	RH,HA,RV,BE,SS	Grazing.
FWS Butte Creek	RH,HA,RV,BE,SS,T	Grazing.
<u>SACRAMENTO COUNTY</u>		
FWS Sacramento River	T,Flow	Water storage upstream.
Cosumnes River S	T,SR	Unknown.
FWS American River	T,SR,Flow	Water storage upstream.
<u>SAN JOAQUIN COUNTY</u>		
FWS Mokelumne River below Camanche Dam	T,SR Inadequate flows Seasonally Low Dissolved Oxygen Hydrogen Sulfide	East Bay MUD operation of Pardee and Camanche Reservoirs.
<u>SIERRA COUNTY</u>		
✓ Kanaka Creek S	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.
Oregon Creek S	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.



Willow Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive Erosion. mild urbanization in certain areas with sewage problems.
Indian Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.
Miller Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.
Lucky Dog Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. urbanization in certain areas with sewage problems.
Marion Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. urbanization in certain areas with problems.
Carney Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.
Secret Canyon Creek	5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.

Jim Crow Creek 5	T,SS,SR,RH,HA,RV	Extensive mining activity including hardrock & placer mines. Instream operations common. road construction, logging operations a Secondary Contributor. Extensive erosion. mild urbanization in certain areas with sewage problems.
Ladies Canyon 5	SS,RH,HA	Mining debris & ongoing operations continue.
Canyon Creek 5	T,SS,RH,HA,RV	Logging, road building, mining & urbanization.
Whiskey Creek 5	T,SS,RH,HA,RV	Massive mining operations, continuing problems with outflow and erosion control.
Slate Creek 5	T,SS,RH,HA,RV	Massive mining operations, continuing problems with outflow and erosion control.
Cold Stream Creek 6	SS,RH,HA,RV	Massive sedimentation and erosion from Sierra Valley Water Dist., diversion from Little Truckee River.
Onion Creek 6	SS,RH,HA,RV	Massive sedimentation and erosion from Sierra Valley Water Dist., diversion from Little Truckee River.
Little Truckee River 6	SS,RH,HA,RV	Extensive water diversion by Sierra Valley Water District.
Downie River 5	SS,SR,RH,HA,RV	Extensive mining operations. Road problems along river.
FWS N.F. Yuba River	SS,RH,HA,RV	Extensive logging, road building, river crossings, mining and associated erosion problems.
Dog Valley Creek 6	T,SS,RV	Grazing problems, upstream logging operations (all USFS).
<u>YUBA COUNTY</u>		
Willow Creek 5	T,SS,RH,RV	Logging on private property, poor road building practices.
Mill Mill Creek 5	T,SS,RH,RV	Logging on private property, poor road building practices.
New York Creek 5	T,RH,RV	OWID water diversion and maintenance problems.
Costa Creek 5	T,SS,RH,RV	Extensive private development along creek.

Dobbins Creek 5	T,SS,SR,RH,RV	Extensive on stream ponds and diversions. urbanization.
Dry Creek 5 (Collins Lake Drainage)	T,SS,SR,RV	Numerous impoundments & diversions. Private development, recreation parks, road problems.
Ellis Lake 5	T,SS,RH,CP	Urban lake. Numerous urban chemical inputs (spills). Poor Water Quality.
Francis Lake 5	T,RH,HA,RV	Massive water diversions by Yuba Co. W.A.
Dry Creek 5 (Beale AFB)	T,CP	Heating impoundments, water diversions, copper mine leachate from Spenceville Mine.
Owl Gulch Creek 5	T,SS,RH,RV	Logging activity with roads: Soper-Wheeler Lumber Co.
Tennessee Creek 5	T,RH,RV	Water diversion corridor, variable flows, reduced riparian for "Transport".
S.F. Honcut Creek 5	T,SS,RH,RV	Large diversions by OWID. Assorted private lands development along stream.

1/ Problem Codes:

T = temperature
 SS = substrate loss to siltation
 SR = substrate loss to removal or lack of recruitment
 RH = loss of rearing habitat
 HA = loss of (adult) holding areas
 RV = Riparian habitat (vegetation) destruction
 CP = chemical problems
 BE = bank erosion
 Other = defined

BP

flow suggest that future surficial movement rates at some portions of these features may be greater than those measured to date. Accelerated movement will likely occur when threshold values of antecedent moisture, pore-water pressure, and/or mass distribution have been exceeded. Since threshold values do not appear to have been exceeded throughout both earthflows in 8 years of study, threshold effects have not been completely documented. Extrapolation of records in both space and time is therefore difficult.

HI-2-A 4

SEDIMENT ROUTING IN TRIBUTARIES OF THE REDWOOD CREEK BASIN, NORTHERN CALIFORNIA

John Pitlick (Redwood National Park, Arcata, California 95521)
David Best (Same)
(Sponsor: Robert Limerick)

Data from 16 tributary study basins within the 720 km² Redwood Creek basin indicate that tributaries are major sediment sources for the main stem of Redwood Creek. This is a reflection of both the magnitude of point source contributions within these basins and the relative efficiency with which these low-order, high gradient (0.1 - .30) streams transport the supplied load.

Streamside landslides and channel stored sediment were measured conjunctively in 16 tributaries draining highly erosive and heavily logged terrain. Estimates of fluvial sediment yield from disturbed slopes were determined by characterizing areas of similar terrain and then measuring gully erosion within each terrain type. Temporal changes in source area activity were determined by sequential aerial photo review.

Streamside landslides in tributary watersheds are as large and as complex as similar landslides along the main channel of Redwood Creek. Of the 990 slides measured in the tributary basins, the 20 largest slides total 1,397,000 tonnes with more than 80 percent of this mass being delivered between 1954 and 1980. By comparison, the 20 largest slides measured along the upper 34 km of the main channel of Redwood Creek total 1,353,000 tonnes. A majority of the study basins now store less than 20 percent of the material supplied to them by landslides initiated during this period. Fluvial sediment yield from differing terrain types within these basins ranges from 2,500 tonnes/km² to 97,000 tonnes/km².

HI-2-A-5

MAIN CHANNEL RESPONSE TO INCREASED SEDIMENT SUPPLY, UPPER REDWOOD CREEK, CALIFORNIA

Michael Coghlan (Redwood National Park, Arcata, California 95521)
Mary Ann Madej (Same)
(Sponsor: Thomas Lisle)

In 1947 the Redwood Creek watershed in northern California was essentially undisturbed. Since then extensive road-building and timber harvest activities have affected most of the watershed. A combination of landuse impacts, naturally unstable terrain, and six major storms has substantially increased the basin's sediment yield. Most of the main channel has been extensively altered, and there has been a large increase in the amount of channel-stored sediment.

These changes can be illustrated by outlining those occurring along the stream's uppermost 21 km of channel (D.A. 110 km²). By 1962 48% of this reach had been logged. Extensive harvesting had also occurred along the tributary channels. Approximately 160 new main channel landslides had been initiated. The channel had widened locally, and about 41,000 t. of sediment had been deposited. The 1964 storm caused widespread landsliding, bank erosion, and aggradation. By 1964 about 100 new main channel slides had occurred, and most of the older ones had increased in size. Most of the post-1947 landslide contributions from tributary as well as from main channel hill-slopes had occurred. The amount of stored sediment had increased to 2,202,000 t. By 1973 40% of this material had left the reach, representing a bedload transport rate of 850 t/km²/yr attributable to erosion of the streambed.

In total, by 1980 about 340 new main channel slides had occurred, releasing about 1,920,000 t. of slope material. 64% of the channel had been logged. The channel had degraded to nearly its 1947 level; however 1,100,000 t. of sediment was still in storage, 35% of which formed fill terraces dating from the 1964 and 1972 storms. Sediment storage varies from 316 to 5550 m³/100m of channel, and its distribution correlates roughly with channel gradient.

HI-2-A-4

ENTRAINMENT OF GRAVEL AND COBBLES FROM A NON-UNIFORM STREAMBED

Edmund D. Andrews (U.S. Geological Survey, Denver Federal Center, Lakewood, CO 80225)

The critical dimensionless shear stress, τ_{ci} , required to entrain a given size particle, τ_{ci} , was computed from extensive bedload-transport measurements in three self-formed rivers with naturally sorted gravel and cobble bed material. The range of bed-particle diameters examined was 4.9 to 107 millimeters. The value of τ_{ci} is significantly affected by the size distribution of the streambed material. For bed particles between 0.3 to 4.2 times the median diameter of the subsurface bed material, d_{50} , the average critical dimensionless shear stress, τ_{ci} , is equal to

$$\tau_{ci} = 0.083(d_i/d_{50})^{-0.876}$$

with a correlation coefficient of 0.987. For bed particles larger than 4.2 times d_{50} , τ_{ci} appears to approach a constant value of approximately 0.020 in a non-growing channel. Thus, τ_{ci} will range from 0.25 to 0.020 for a given particle depending on the ratio of d_i to d_{50} . This range agrees with those of previous investigations of critical shear stress for a given particle size. Therefore, this analysis indicates that virtually all of the observed variation may be due to differences in the size distribution of subsurface bed material.

This analysis shows that τ_{ci} is almost inversely proportional to the particle diameter for a non-uniform bed material and, therefore, at a particular site, bed particles between 0.3 to 4.2 times d_{50} are entrained at nearly the same discharge.

HI-2-A-7

EFFECT OF AGGRADATION AND DEGRADATION ON BAR STRUCTURE IN NATURAL GRAVEL CHANNELS, NORTHERN CALIFORNIA AND SOUTHERN OREGON

Thomas E. Lisle (USDA, USFS, 1700 Bayview, Arcata, CA 95521)

Changes in bar structure are important adjustments to states of grade and sediment supply in natural gravel channels. Tensive gaging sections in northern California and southern Oregon viewed as such as 100 percent and aggraded as much as 4 m and then degraded to stable levels over a total time span of 5 years or more after the flood of December, 1964 to January, 1965. Bed material became finer with aggradation. Bar sediment decreased with aggradation, as indicated by the diminishment of pool characteristics observed in longitudinal profiles and in hydraulic geometries. At gaging sections in pools, values of velocity at a given discharge increased and values of depth decreased with aggradation. There was no change in velocity or depth above the values of discharge whose recurrence intervals on the annual flood series are 1.0 to 2.9 years. Hydraulic geometries recovered to a limited degree with degradation; full recovery probably occurs on channel narrowing and further depletion of sediment supply. The hydraulic changes reflect an increase in bedload transport capacity at low to moderate flow. This provides an effective mechanism for transporting excess sediment out of channels when additional contributions from watersheds are usually slight. The increase in transport at moderate flows increases the effectiveness of such flows to form bars relative to flood flows. Under these conditions, bars are expected to be smaller. Pools tend to fill during bed load transport at relatively low flows and riffles areward with relatively fine material tend to erode rearward and form a gentler gradient.

HI-2-A-8

STATISTICAL MODELING OF BEDLOAD TRANSPORT IN ROCKY MOUNTAIN STREAMS

Donald M. Simson (Colorado Dept. of Health, Denver, CO)
Donald O. Dohring (Dept. of Earth Resources, Colorado State Univ., Ft. Collins, CO)

During the past few years, a series of statistical models have been developed to predict bedload transport rates for steep gradient streams in mountain settings. The streams we have studied are located in metamorphic crystalline terranes that typically

Pitlick, J., and D. Best.

1981. Sediment Routing in Tributaries of the Redwood Creek Basin, Northern California. EOS Redwood National and State Parks, November 10, 1981.

Coghlan, M., and M.A. Madej.

1981. Main Channel Response to Increased Sediment Supply, Upper Redwood Creek, California. EOS Redwood National and State Parks, November 10, 1981.

Madej, M.A., D.K. Hagans, V. Ozaki.

1981. Aggradation and Degradation in Redwood Creek, Northwestern California, Over Three Time Scales. EOS Redwood National and State Parks, October 24, 1989.

HI-2-A-9

MR. ST. HELENS SEDIMENT TRANSPORT: THE FIRST YEAR

Jeffrey L. Bradley (Portland District, USACE, Portland, OR 97208)

Two primary purposes of sedimentation studies being conducted by Portland District are the determination of sediment yield from the Toulce River watershed, and sediment deposition in the Colville River. Suspended sediment yield from the Toulce River for an average water year has been estimated from suspended sediment concentrations of samples taken at Toulce River gaging stations. Analytical methods were used to fit the Colby bed material transport function to observed data from sampling stations along the Colville and Toulce Rivers.

The objective of the analytical approach is to develop water and sediment yields for a given hydrologic record at selected river cross-sections. The computed sediment load curves at these stations were developed using Colby's 1964 bed material transport function and have been fit to sampled data. As the bed material in the system is composed primarily of sand the use of the Colby function appeared to be appropriate. A sediment mass balance for 1980-81 Colville River deposition has been determined using these analytically derived relationships. The difference in sediment yield values at stations obtained in this manner are directly comparable to differences between river surveys and dredged quantities throughout the winter. Future estimates of sedimentation for the average annual water year have been made by integrating the Colby sand load curves and the appropriate flow duration curve at each station. Additionally sand yield discharge hydrographs of the winter's major storm events have been analyzed using both observed data and Colby load curves.

HI-2-A-10

ALLUVIAL RIVER CHANNEL SCOUR MODEL

D. S. Graham (Tudor Engineering Company, San Francisco, CA 94105)

A numerical model has been developed to predict the scour in alluvial channels during large discharge events. Its purpose is to assist in the design of appropriate burial depths for pipelines beneath rivers. The model is based upon a tractive force approach in a cross-sectional analysis, with modifications for nonzero sediment flow. The basic equation

$$r_n(Q, S, b, d, Q_s, Q_b) = 0$$

where Q - discharge, S - slope, b - width, d - depth, Q - particle size, and Q_s - sediment discharge is closed by equations expressing continuity, momentum conservation, $\tau_b = \tau_c$ on the boundary (where τ is the shear force) and sediment continuity. The model appears to predict selected scour events drawn from the literature reasonably well. It works particularly well for coarse-bedded rivers if values recently proposed for the dimensionless critical shear stress for gravels are used.

Field data from the South Yuba basin, California reveal spatial patterns of transport and storage of hydraulic mining sediment that are considerably different than patterns in the Bear River reported elsewhere. Mountainous trunk channels of the South Yuba are eroded to bedrock with little evidence of sediment storage. Explanations for this contrast with the Bear River basin, where long-term sediment storage has been overwhelming, include channel gradient, catchment area, and differences in geomorphic history.

The timing of sediment transport in the Bear River has been dramatically different than predicted by Gibben's *symmetrical sediment wave model*. Lack of main channel storage in the South Yuba suggests a sediment wave more similar to Gibben's concept, although sustained storage and mobility of sediment in some tributary channels suggest that a *skewed wave model* is also appropriate to that basin. Thus, even in the type locale of Gibben's model, sediment deliveries are skewed in respect to time. This temporal relationship is more subtle in the steep gorges of the Yuba basin, but differences with the Bear River are in degree not kind.

HS2A-2 1330H

Aggradation and Degradation in Redwood Creek, Northwestern California, Over Three Time Scales:

M. A. Hagedorn (Redwood National Park, 1125 16th St., Arcata, CA 95521 (707) 822-7611)
D. K. Hagans, V. Ozaki (Both at above)

Aggradation and degradation spanning three time scales have been studied in the Redwood Creek basin. Floodplain sediments several thousand years old and up to 7.7 m deep were sampled by backhoe trenches and soil cores. Results from stratigraphic analyses and C14 dating suggest one floodplain rose about 1.3 m in 810 years (-/50y), through a minimum of 5 major episodes of flood deposition. Individual fining-upward flood deposits laid down between 3520 and 810 ybp range from 40 to 120 cm thick and have weak soil (A horizon) development. Deposits younger than 810 ybp are less than 40 cm thick and show little to no soil development, suggesting episodes of overbank flooding occur more frequently, but deposit less sediment than prior to 810 ybp. Modern (post-1950) flood deposits are limited spatially and average <10 cm/event. In contrast, over several decades, a similar amount of channel filling (1-2 m) occurred in steep tributaries in one flood event, but 70% was then removed in 5 to 10 years. Likewise, in the 1964 flood the main channel of Redwood Creek (area = 720 km², gradient = 1.4%) aggraded several meters in headwater areas. Channel cross section surveys show that subsequent erosion and transport of upstream flood deposits caused aggradation downstream during the last 14 years. The locus of aggradation shifted 6 km downstream in 9 years. Finally, on the scale of one high flow season, detailed topographic surveys show that fine-grained gravel 'sheets' 0.2-1 m high were deposited on gravel bars; raising the mean channel bed elevation. These gravel 'sheets' are only found in reaches displaying recent aggradation. Although floodplain deposits provide a long-term record of sedimentation, they may not document significant short-term fluctuations in sediment storage and channel morphology due to landuse.

HS2A-3 1345H

Hydrologic and Geomorphic Characteristics of Landslide-Dam-Break Floods in the Cascade Mountains of Washington

Lee Banda (Dept. of Geological Sciences, University of Washington, Seattle, Wa. 98195)
Weihsu Zhang (Dept. of Civil Engineering, University of Washington, Seattle, Wa.)

Extreme floods which occur episodically in confined valleys in the Cascade Mountains of Washington due to rapid erosion of landslide or debris flow dams can lead to degradation and aggradation of channels and valley floors. Peak discharges associated with landslide-dam-break floods in these terrain can exceed those of even long-recurrence interval runoff floods by one to two orders of magnitude. Recurrence intervals of dam-break floods may range between 10¹ and 10⁴ years, and are partly controlled by the number of potential landslide and debris flow sites adjacent to confined valleys. Incorporation of large volumes of vegetative debris, including entire trees, by the flood increases the frictional resistance of the flow and leads to increased flood heights. Periodic damming of the flood by the debris may lead to flood surges. Landslide-dam-break floods may encompass entire valley floors and generate extremely high shear stresses up to 2500 N/m². Erosional and depositional features resulting from the flood wave are controlled primarily by the geometry of the valley floor rather than the geometry of the channel. Erosion of sediment by flood waves may expose bedrock along channels and valley floors. Massive deposition of sediment and vegetative debris leads to formation of terraces, ledges and flood levees, including Boulder Berms.

HS2A-4 1400H

Recent Hydrologic Changes in Lower Las Vegas Wash, Clark County, Nevada

William J. Whitney (U.S. Geological Survey, Federal Building, 1015 North 3rd St., Reno, NV 89701; 702-887-7600)
John Whitney (U.S. Geological Survey, Federal Center, MS 713, Denver, CO 80225; 303-236-1246)

Las Vegas Wash drains about 1,600 mi², including metropolitan Las Vegas, to Lake Mead on the Colorado River. Radiocarbon dating of organic sediments indicates uninterrupted flood-plain aggradation during the last 3,000 years throughout the lowermost 6-1/4 mi reach of the wash. Several cycles of channel cutting and filling predate emplacement of the late-Holocene fill which consists primarily of thin, upward-fining strata of fine-grained sediments that appear to have been deposited by infrequent, sluggish flows.

The lower wash was ephemeral before settlement; early historic evidence documents a dominantly sparse, xerophytic vegetation. Upstream population has grown from about 5,000 in 1930 to about 700,000 in 1989. Wastewater discharge through the lower wash has increased in parallel with population growth; flow became perennial in 1955, averaged 63 cfs by 1975, and may average more than 150 cfs in 1989. By 1965, increasing flows supported dense phreatophytic and halophytic growths, and marshlands were common.

Increasing streamflow progressively modified channel morphology, and channel degradation in the late-Holocene deposits was apparent by 1969, when average flow approached 40 cfs. Thereafter, erosion progressed because of both increasing wastewater flows and superimposed flood flows. Erosion, which climaxed during the flood-dominated summer of 1984, cumulatively removed about 1/4 million yd³, or 2,700-acre-ft, and redeposited most of it in Lake Mead; this volume is equivalent to a length of 33,000 ft, a width of 200 ft, and a depth of 17 ft. Extensive damage to roads, pipelines, and wetlands resulted, and erosion continues. A dam presently being constructed 2 mi upstream from the south of the wash will modify erosion and deposition trends along a several-mile reach.

HS2A-5 1415H

Timing and Possible Causes of Late Holocene Erosion and Aggradation, Southwestern Colorado Plateau, U.S.A.

Richard Hargrave (U.S. Geological Survey, 2235 N. Gemini Dr., Flagstaff, AZ 86001; 602-527-1259)

Robert H. Webb (U.S. Geological Survey, 300 W. Congress St., Tucson, AZ 85701-1393; 602-629-2221)

Since about A.D. 1200, streams of the semiarid southwestern Colorado Plateau have undergone two episodes of aggradation and erosion on different spatial and temporal scales. The early erosional episode began between A.D. 1150-1250 and lasted until about A.D. 1400. This episode caused widespread entrenchment of continuous channels and lowered water tables. Aggradation beginning about A.D. 1400 extended to first order basins and resulted in deposition of a valley-floor and a valley-margin alluvial facies. These deposits record the filling and overtopping of the entrenched channels with sediment derived primarily from adjacent hillslopes and secondarily from collapsing channel walls. Perennial surface water was more abundant than at present, and low stage floods occurred in the period A.D. 1400-1800. The cause of this widespread alluviation is probably related to climate anomalies of the Little Ice Age. Intensification of hillslope weathering may have created an oversupply of sediment to alluvial channels.

The recent erosional episode began about A.D. 1980, although the wear varies among basins. The erosion was rapid, propagated into first order basins, and resulted in lowered water tables and deeply incised continuous channels. The channels remained wide and deep until the early 1980s, suggesting that sediment was primarily transported through the channel system. Although erosion closely followed human occupancy of the area, erosion was probably caused by an increase of summer-early fall (warm-season) rainfall that in turn was associated with increased frequency of El Niño-Southern Oscillation (ENSO) conditions in the Pacific Ocean.

The present aggradational episode began in the early 1940s and resulted in partial filling of the former channel system through development of floodplains in second and higher order basins. After the early 1940s, the frequency of large floods, average daily discharge of tributary streams, and the sediment load of the Colorado River decreased substantially. The decrease in flood frequency and daily discharge is closely related to a 10-15 percent decrease of annual rainfall frequency during the warm season and to a possible 4-6 week shortening of the average rainy season. These rainfall changes are in turn linked to a decrease in the number of dissipating tropical cyclones over the Cukwako Plateau and to a change in the frequency and effective season of ENSO conditions.

HS2A-6 1430H

THE HILLSLOPE RECORD OF EROSION AND DEPOSITION CYCLES

J. R. J. Harrison (Dept. of Geology, Otago, Dunedin, New Zealand)
John J. Harrison (Dept. of Geology, Otago, Dunedin, New Zealand)
P. J. Tonkin (Soils Dept Lincoln College, Canterbury, New Zealand)

Two cycles of erosion and deposition are recorded in soil profile morphology and slope deposits in the eastern foothills of the Southern Alps of New Zealand. Both periods of instability occurred after fires (in 1300 and 1840 AD) had destroyed the pre-existing vegetation. A soil survey of a small drainage basin revealed a complex mosaic of soils. A conceptual model was developed which describes the changes in soil profile morphology within a cycle of erosion and deposition. Four morphogenetic soil profile classes form over one cycle of instability when maximum and minimum conditions of

W. E. Dietrich & D. R. Montgomery (Dept. Geol. & Geophys., Univ. Calif., Berkeley, 94720)
A. L. Coelho Netto, J. R. S. Moura & M. F. Fernandes (Inst. Geografia, Inst. de Geociencias, Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil)
J. C. Davis, J. Proctor, J. Vogel & J. Southon (Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory, P.O. Box 508, Livermore, CA 94550)

Extensive field studies in the hilly uplands of the Southeastern Brazilian Plateau has led to the recognition of at least four colluvial units and terraces that appear to be of Holocene age and contain important clues about the relationships between climate fluctuations, base-level changes and cycles of aggradation and incision over a broad region. As a first step towards testing the hypothesis that the deposits record regionally synchronous events we collected small amounts of charcoal and leafy stems from a number of sites in the Bananal area and later them using accelerator mass spectrometry. A pollen on the colluvial unit, Bom Retiro, for which the age 9330 ± 160 BP had already been obtained was sampled at four different sites from widely varying topographic positions, yielding ages of 8750 ± 950, 9541 ± 200 and 9970 (±300) clearly defining onset of Holocene aggradation. Three ages of the basal exposure of the highest terrace on two different drainages gave 9482, 9330 and 8970 (±300) BP indicating that main valley aggradation began about the same time as the terrace formed. Several dates within and near the top of the highest terrace and within the next highest terrace on one valley show that incision of the highest surface formation of lower alluvial terraces occurred within last 200 years. This surprising result suggests that early deforestation in parts of southeastern Brazil greatly destabilized river valleys and hillslopes leading to the current state of deeply incised valleys and gullied hillslope deposits.

HS2A-8 1500H

Ensemble Stability Criterion for Drainage Patterns Development on Hillslopes

G. Roth & F. Secchi (Institute of Hydraulics, University of Geneva, 1 Montsalvo, 12145 Geneva, Italy, IDWRU at IGICUNIV)

A simple model is presented which connects the cyclic aggradation and incision of hillslope drainage networks to intense rainfall temporal pattern. It represents drainage formation and degradation on a plane rectangular area by a two-dimensional mathematical model in which mass and momentum conservation describe water and sediment movement. According to Roth & WRR (1982, 1989), the mechanism of the movement of sediment particles is assumed as the active source of channel differentiation on a rectangular area surface at the hillslope scale. Analyzing network sensitivity to hillslope geometry, soil characteristics, and rainfall intensity, 30 controlled experiments of drainage network formation have been carried out, by means of the mathematical model, for different parameter sets.

The results are summarized with reference to two measures of network stability on the slope: length of the total network system that develops in an area under exam, L_n , and runoff concentration at the downstream end of the plane, R_n . Both are presented in a non-dimensional form with reference to the same characteristics for a Peano network that develops on the same area and as functions of r_n , the ratio between actual bottom shear stress and critical value.

They show that, increasing r_n , first the developing of a drainage network on the surface can be detected, both in terms of L_n and R_n , with a maximum value around $r_n = 1.5$ followed by a quasi-exponential decrease at larger r_n . For very large r_n , no network formation is observed in terms of drainage network and also the ability to concentrate runoff on the surface is very poor. The increase of shear stress and sediment transport rate the surface is out by water and sediments and no stable drainage pattern can develop.

The results obtained from the simulation of the erosional development of drainage patterns can be used to give a physical interpretation of the evolution of a network which develops on a hillslope of given geometry and soil characteristics excited by a rainfall field non uniform in space. The function of rainfall intensity only, i.e., $r_n(t)$, and the surface characteristics of random duration and intensity, randomly distributed in time, a rainfall event can be classified as:
active: the rainfall intensity of the storm is low than the critical value for which $r_n = 1.5$. The pattern of the surface, i.e. the present drainage organization on the hillslope, is not changed, irrespective of the duration of the storm;
active: the storm intensity is able to develop a drainage network on the surface, improving the drainage organization of the hillslope. The storm duration greater than the characteristic time for rainfall intensity organization on the slope, t_n , is needed.
catastrophic: the storm intensity $r_n > 1.5$ value for which the network is washed out by sediments, and if the duration of this storm is greater than

undercut banks. Of the Level II habitat types Pools had the highest shelter rating at 10. Of the Level III habitat types Backwater Pools had the highest shelter rating at 40. These values are low as shelter values of 80 or higher are considered optimal for good rearing habitat (Flosi and Reynolds 1994).

Large Woody Debris

The presence of Large Woody Debris in streams is a significant component of fish habitat. Woody debris creates areas of low flow, providing a refuge for fish during periods of high flow (Robison and Beschta, 1990). Woody debris also provides cover for fish, lowering the risk of predation. The percent of pools formed by LWD in West Fork Abalobadiah Creek was 31%. Whether these numbers are high or low, relative to the needs of salmonids is difficult to ascertain since the optimum amount of woody debris in streams has not been specified (Robison and Beschta 1990). However, based on data from Georgia-Pacific's 1995 Aquatic Vertebrate Study, the only coho found in the Ten Mile River Basin were in stream reaches where approximately 50% of pools were formed by large woody debris. Those reaches that did not support coho had a significantly lower percentage of pools formed by large woody debris (Ambrose et al, 1996). This suggests that a low percentage of LWD formed pools could adversely affect juvenile Coho Populations (C.S. Shirvel 1990).

The above LWD analysis pertains only to pools formed by logs or root wads as described in Flosi and Reynolds (1994): Lateral Scour Pool Log Enhanced, Lateral Scour Pool Root Wad Enhanced, Backwater Pool Log Formed and Backwater Pool Root Wad Formed. Other pools containing LWD as a component were not included in the calculation. For example, plunge pools may be formed by boulders, bedrock or LWD but are not described as such by habitat unit types. Therefore, the LWD formed pool calculation is limited to four pool types and does not quantify the amount of LWD in West Fork Abalobadiah Creek.

Canopy

There are two important benefits of canopy cover in coastal streams. Canopy keeps stream temperatures cool as well as providing nutrients in the form of leaf litter and organic material (Bilby 1988). This leaf litter, organic material, and their associated nutrients are utilized as a food source by benthic macroinvertebrates (aquatic insects). The macroinvertebrates, in turn, are major food sources for most fish species in forested areas (Gregory et al., 1987). Mean percent canopy cover for the West Fork Abalobadiah Creek was 94%. This is high since a canopy cover of 80% or higher is considered optimum, Flosi and Reynolds (1994).

Deciduous trees occupied a larger portion of the canopy than did coniferous trees. Coniferous trees comprised only 16% of the canopy. Wood from alder and most other deciduous species deteriorates more rapidly than wood from coniferous species (Sedell, et al. 1988). Therefore, less LWD would be available in the future for fish cover and LWD formed pools in this creek and others dominated by deciduous species.

Embeddedness

Section I. General Information, Hilltop THP (34-02), (36-01), (36-03)

Southern

FOR ADMIN. USE ONLY
Amendments-date & S or M

1. _____ 7. _____
2. _____ 8. _____
3. _____ 9. _____
4. _____ 10. _____
5. _____ 11. _____
6. _____ 12. _____

TIMBER HARVEST PLAN
STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY
AND FIRE PROTECTION
RM-63 (1-98)

FOR ADMIN. USE ONLY

THP No. 1-98-379 MEN
Dates Rec'd OCT 21 1998
Date Filed _____
Date Approved _____
Date Expires _____
Extensions 1) [] 2) []

If this is a Modified THP, check box
[]

This Timber Harvesting Plan (THP) form, when properly completed, is designed to comply with the Forest Practice Act (FPA) and Board of Forestry rules. See separate instructions for information on completing this form. NOTE: The form must be printed legibly in ink or typewritten. The THP is divided into six sections. If more space is necessary to answer a question, continue the answer at the end of the appropriate section of your THP. If writing an electronic version, insert additional space for your answer. Please distinguish answers from questions by font change, bold, or underline.

Reference: G.P. Area # (34-02), (36-01), (36-03)
Hilltop THP

SECTION I - GENERAL INFORMATION

This THP conforms to my/our plan and upon approval, I/we agree to conduct harvesting in accordance therewith. Consent is hereby given to the Director of Forestry and Fire Protection, and his or her agents and employees, to enter the premises to inspect timber operations for compliance with the Forest Practice Act and Forest Practice Rules.

1. TIMBER OWNER(S) OF RECORD:

Name: Georgia Pacific Corporation
Address: 90 West Redwood Ave
City: Fort Bragg State: CA Zip: 95437 Phone: (707)-961-3302

Signature Ronald P. Monk Date 10-19-98
Printed Name: Ron Monk

NOTE: The timber owner shown above is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Division, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0001.

Additional Timber Owner: Richard C. Wharton. See Section V

2. TIMBERLAND OWNER(S) OF RECORD:

Name: Georgia Pacific Corporation
Address: 90 West Redwood Ave
City: Fort Bragg State: CA Zip: 95437 Phone: (707)-961-3302

Signature Same as 1 above Date _____

Additional Timberland Owners: Richard C. Wharton and Mick Harrison. See Section V.

RECEIVED
OCT 21 1998
COAST AREA OFFICE
RESOURCE MANAGEMENT

MEMORANDUM

To: Bob Barnum **Date:** April 21, 1999
From: Steve Horner
Re: Impaired Waterbody Lists

Bob,

I have located the code section that identifies the timing of 303(d) "impaired waterbody" lists.

The Environmental Protection Agency code section is 40 CFR 130.7 (d) (1), and states "...each State shall submit to EPA lists required under paragraph (b) of this section on April 1 of every even-numbered year." The section continues under paragraph (2), "the Regional Administrator shall approve or disapprove such list[s]...not later than 30 days after the submission." Further on, the same paragraph states "the Regional Administrator shall promptly issue a public notice seeking comments on such list[s]." Section 130.7 (b)(1) states that "each State shall identify...water quality-limited segments...requiring TMDL's."

The Federal Water Pollution Control Act Section 303(d)(1)(A) states that "each State shall identify those waters within its boundaries for which [required] effluent limitations...are not stringent enough to implement any water quality standard applicable to such waters." The regulations of 40 CFR 130.7 in part guide EPA toward meeting the requirements of the Federal Water Pollution Control Act Section 303(d).

Copies of the code section and Section 303(d) are attached.

FEDERAL WATER POLLUTION CONTROL ACT

Section 303(d)

(1)(A) Each State shall identify those waters within its boundaries for which the effluent limitations required by section 301(b)(1)(A) and section 301(b)(1)(B) are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters.

(B) Each State shall identify those waters or parts thereof within its boundaries for which controls on thermal discharges under section 301 are not stringent enough to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife.

(C) Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 304(a)(2) as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

(D) Each State shall estimate for the waters identified in paragraph (1)(B) of this subsection the total maximum daily thermal load required to assure protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife. Such estimates shall take into account the normal water temperatures, flow rates, seasonal variations, existing sources of heat input, and the dissipative capacity of the identified waters or parts thereof. Such estimates shall include a calculation of the maximum heat input that can be made into each such part and shall include a margin of safety which takes into account any lack of knowledge concerning the development of thermal water quality criteria for such protection and propagation in the identified waters or parts thereof.

(2) Each State shall submit to the Administrator from time to time, with the first such submission not later than one hundred and eighty days after the date of publication of the first identification of pollutants under section 304(a)(2)(D), for his approval the waters identified and the loads established under paragraphs (1)(A), (1)(B), (1)(C), and (1)(D) of this subsection. The Administrator shall either approve or disapprove such identification and load not later than thirty days after the date of submission. If the Administrator approves such identification and load, such State shall incorporate them into its current plan under subsection (e) of this section. If the Administrator disapproves such identification and load, he shall not later than thirty days after the date of such disapproval identify such waters in such State and establish such loads for such waters as he determines necessary to implement the water quality standards applicable to such waters and upon such identification and establishment the State shall incorporate them into its current plan under subsection (e) of this section.

(3) For the specific purpose of developing information, each State shall identify all waters within its boundaries which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margins of safety, for those pollutants which the Administrator identifies under section 304(a)(2) as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish and wildlife.

(4) LIMITATIONS ON REVISION OF CERTAIN EFFLUENT LIMITATIONS.--

(A) **STANDARD NOT ATTAINED.**--For waters identified under paragraph (1)(A) where the applicable water quality standard has not yet been attained, any effluent limitation based on a total maximum daily load or other waste load allocation established under this section may be revised only if (i) the cumulative effect of all such revised effluent limitations based on such total maximum daily load or waste load allocation will assure the attainment of such water quality standard, or (ii) the designated use which is not being attained is removed in accordance with regulations established under this section.

(B) **STANDARD ATTAINED.**--For waters identified under paragraph (1)(A) where the quality of such waters equals or exceeds levels necessary to protect the designated use for such waters or otherwise required by applicable water quality standard, any effluent limitation based on a total maximum daily load or other waste load allocation established under this section, or any water quality standard established under this section, or any other permitting standard may be revised only if such revision is subject to and consistent with the antidegradation policy established under this section.

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Environmental Protection Agency

\$ 130.7

s, policies and legisla-
for protection of

and resource assess-
in accordance with sec-
Act.

to control sources of
ground-water includ-

that State and areawide WQM plans to-
gether include all necessary plan ele-
ments and that such plans are consist-
ent with one another. The Governor or
the Governor's designee shall certify
by letter to the Regional Adminis-
trator for EPA approval that WQM

Federal authority (law, regulation, or
treaty); and

(iii) Other pollution control require-
ments (e.g., best management prac-
tices) required by local, State, or Fed-
eral authority are not stringent
enough to implement any water qual-
ity standards (WQS) applicable to such
waters.

OPTIONAL FORM 89 (7-90)

FAX TRANSMITTAL

of pages - 3

To <u>Steve Horner</u>	From <u>Dave Smith</u>
Dept./Agency	Phone #
Fax #	Fax #

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23,

NSN 7540-01-317-7368 5089-101 GENERAL SERVICES ADMINISTRATION

s. An Indian Tribe is
purposes of this rule
Water Act assistance
40 CFR part 35, sub-

Tribe has a governing
t substantial govern-
powers;

is to be exercised by
pertain to the man-
tection of water re-
s held by an Indian
he United States in
held by a member of
such property inter-
trust restriction on
rwise within the bor-
eservation; and
Tribe is reasonably ex-
ble, in the Regional
dgment, of carrying
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; with the terms and
lean Water Act and
ions.

rtification. State and/
WQM plans shall be
to reflect changing
ditions, results of im-
ions, new require-
e conditions in prior
rtial plan approvals.
trators may require
plans be updated as
ontinuing Planning
shall specify the
hule used to revise
State shall ensure

\$130.7 Total maximum daily loads
(TMDL) and individual water
quality-based effluent limitations.

(a) General. The process for identify-
ing water quality limited segments
still requiring wasteload allocations,
load allocations and total maximum
daily loads (WLAS/LAs and TMDLs),
setting priorities for developing these
loads; establishing these loads for seg-
ments identified, including water qual-
ity monitoring, modeling, data analy-
sis, calculation methods, and list of
pollutants to be regulated; submitting
the State's list of segments identified,
priority ranking, and loads established
(WLAS/LAs/TMDLs) to EPA for ap-
proval; incorporating the approved
loads into the State's WQM plans and
NPDES permits; and involving the
public, affected dischargers, designated
areawide agencies, and local gov-
ernments in this process shall be
clearly described in the State Con-
tinuing Planning Process (CPP).

(b) Identification and priority setting
for water quality-limited segments
still requiring TMDLs.

(1) Each State shall identify those
water quality-limited segments still
requiring TMDLs within its boundaries
for which:

(i) Technology-based effluent limita-
tions required by sections 301(b), 306,
307, or other sections of the Act;

(ii) More stringent effluent limita-
tions (including prohibitions) required
by either State or local authority
preserved by section 510 of the Act, or

(2) Each State shall also identify on
the same list developed under para-
graph (b)(1) of this section those water
quality-limited segments still requir-
ing TMDLs or parts thereof within its
boundaries for which controls on ther-
mal discharges under section 301 or
State or local requirements are not
stringent enough to assure protection
and propagation of a balanced indige-
nous population of shellfish, fish and
wildlife.

(3) For the purposes of listing waters
under §130.7(b), the term "water qual-
ity standard applicable to such waters"
and "applicable water quality
standards" refer to those water quality
standards established under section 303
of the Act, including numeric criteria,
narrative criteria, waterbody uses, and
antidegradation requirements.

(4) The list required under
§§130.7(b)(1) and 130.7(b)(2) of this
section shall include a priority ranking
for all listed water quality-limited seg-
ments still requiring TMDLs, taking
into account the severity of the pollu-
tion and the uses to be made of such
waters and shall identify the pollut-
ants causing or expected to cause vio-
lations of the applicable water quality
standards. The priority ranking shall
specifically include the identification
of waters targeted for TMDL develop-
ment in the next two years.

(5) Each State shall assemble and
evaluate all existing and readily avail-
able water quality-related data and in-
formation to develop the list required
by §§130.7(b)(1) and 130.7(b)(2). At a
minimum "all existing and readily
available water quality-related data
and information" includes but is not
limited to all of the existing and read-
ily available data and information
about the following categories of wa-
ters:

(1) Waters identified by the State in
its most recent section 305(b) report as

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40 CFR Ch. I (7-1-95 Edition)

"partially meeting" or "not meeting" designated uses or as "threatened";

(ii) Waters for which dilution calculations or predictive models indicate nonattainment of applicable water quality standards;

(iii) Waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions. These organizations and groups should be actively solicited for research they may be conducting or reporting. For example, university researchers, the United States Department of Agriculture, the National Oceanic and Atmospheric Administration, the United States Geological Survey, and the United States Fish and Wildlife Service are good sources of field data; and

(iv) Waters identified by the State as impaired or threatened in a nonpoint assessment submitted to EPA under section 319 of the CWA or in any updates of the assessment.

(6) Each State shall provide documentation to the Regional Administrator to support the State's determination to list or not to list its waters as required by §§130.7(b)(1) and 130.7(b)(2). This documentation shall be submitted to the Regional Administrator together with the list required by §§130.7(b)(1) and 130.7(b)(2) and shall include at a minimum:

(i) A description of the methodology used to develop the list; and

(ii) A description of the data and information used to identify waters, including a description of the data and information used by the State as required by §130.7(b)(6); and

(iii) A rationale for any decision to not use any existing and readily available data and information for any one of the categories of waters as described in §130.7(b)(5); and

(iv) Any other reasonable information requested by the Regional Administrator. Upon request by the Regional Administrator, each State must demonstrate good cause for not including a water or waters on the list. Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed in the categories in §130.7(b)(5); or changes in conditions,

e.g., new control equipment, or elimination of discharges.

(c) Development of TMDLs and individual water quality based effluent limitations.

(1) Each State shall establish TMDLs for the water quality limited segments identified in paragraph (b)(1) of this section, and in accordance with the priority ranking. For pollutants other than heat, TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. Determinations of TMDLs shall take into account critical conditions for stream flow, loading, and water quality parameters.

(i) TMDLs may be established using a pollutant-by-pollutant or biomonitoring approach. In many cases both techniques may be needed. Site-specific information should be used wherever possible.

(ii) TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards as identified pursuant to paragraph (b)(1) of this section. Calculations to establish TMDLs shall be subject to public review as defined in the State CPP.

(2) Each State shall estimate for the water quality limited segments still requiring TMDLs identified in paragraph (b)(2) of this section, the total maximum daily thermal load which cannot be exceeded in order to assure protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife. Such estimates shall take into account the normal water temperatures, flow rates, seasonal variations, existing sources of heat input, and the dissipative capacity of the identified waters or parts thereof. Such estimates shall include a calculation of the maximum heat input that can be made into each such part and shall include a margin of safety which takes into account any lack of knowledge concerning the development of thermal water quality criteria for protection and propagation of a balanced, indigenous population of shellfish, fish and

Environment

wildlife in parts thereof.

(d) *Submission*
Each State in the Region in 1992 the causing impairment ranking in TMDL development two years after the submission of this assessment. Each State shall submit a report on April 1st of each year. The report shall be submitted as part of the water quality assessment of this part of the CWA or other cover. All TMDLs shall be submitted and quality limited to be reviewed and approved by the Regional Administrator.

(2) The State shall either apply for a permit after the Regional Administrator has developed this rule comments of § 130.7(b)(6) loadings, and submit them into the Regional Administrator such listing later than such discharges in such State for such assessment. The Regional Administrator shall promptly comment. After comment is made, the State shall submit the assessment into the Regional Administrator. (e) For information

Environmental Protection Agency

§ 130.8

wildlife in the identified waters or parts thereof.

(d) *Submission and EPA approval.* (1) Each State shall submit biennially to the Regional Administrator beginning in 1992 the list of waters, pollutants causing impairment, and the priority ranking including waters targeted for TMDL development within the next two years as required under paragraph (b) of this section. For the 1992 biennial submission, these lists are due no later than October 22, 1992. Thereafter, each State shall submit to EPA lists required under paragraph (b) of this section on April 1 of every even-numbered year. The list of waters may be submitted as part of the State's biennial water quality report required by § 130.8 of this part and section 305(b) of the CWA or submitted under separate cover. All WLAs/LAs and TMDLs established under paragraph (c) for water quality limited segments shall continue to be submitted to EPA for review and approval. Schedules for submission of TMDLs shall be determined by the Regional Administrator and the State.

(2) The Regional Administrator shall either approve or disapprove such listing and loadings not later than 30 days after the date of submission. The Regional Administrator shall approve a list developed under § 130.7(b) that is submitted after the effective date of this rule only if it meets the requirements of § 130.7(b). If the Regional Administrator approves such listing and loadings, the State shall incorporate them into its current WQM plan. If the Regional Administrator disapproves such listing and loadings, he shall, not later than 30 days after the date of such disapproval, identify such waters in such State and establish such loads for such waters as determined necessary to implement applicable WQS. The Regional Administrator shall promptly issue a public notice seeking comment on such listing and loadings. After considering public comment and making any revisions he deems appropriate, the Regional Administrator shall transmit the listing and loads to the State, which shall incorporate them into its current WQM plan.

(e) For the specific purpose of developing information and as resources

allow, each State shall identify all segments within its boundaries which it has not identified under paragraph (b) of this section and estimate for such waters the TMDLs with seasonal variations and margins of safety, for those pollutants which the Regional Administrator identifies under section 304(a)(2) as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish and wildlife. However, there is no requirement for such loads to be submitted to EPA for approval, and establishing TMDLs for those waters identified in paragraph (b) of this section shall be given higher priority.

[50 FR 1779, Jan. 11, 1985, as amended at 57 FR 83049, July 24, 1992]

§ 130.8 Water quality report.

(a) Each State shall prepare and submit biennially to the Regional Administrator a water quality report in accordance with section 305(b) of the Act. The water quality report serves as the primary assessment of State water quality. Based upon the water quality data and problems identified in the 305(b) report, States develop water quality management (WQM) plan elements to help direct all subsequent control activities. Water quality problems identified in the 305(b) report should be analyzed through water quality management planning leading to the development of alternative controls and procedures for problems identified in the latest 305(b) report. States may also use the 305(b) report to describe ground-water quality and to guide development of ground-water plans and programs. Water quality problems identified in the 305(b) report should be emphasized and reflected in the State's WQM plan and annual work program under sections 106 and 205(j) of the Clean Water Act.

(b) Each such report shall include but is not limited to the following:

(1) A description of the water quality of all waters of the United States and the extent to which the quality of waters provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows

FILE: PLANNING-30
TMDL 303(d)

ROUTING AND TRANSMITTAL SLIP

Date
3.19.93

TO: (Name, office symbol, room number, building, Agency/Post)

Initials Date
REGION

1. Bob Klamt

APR 2, 93

- 2. BK BB
- 3. CI IG
- 4. FR KD *Ani*
- 5. RT *RTK*

Action	File	<input type="checkbox"/> J	Note and Return
Approval	For Clearance	<input type="checkbox"/> S	Per Conversation
As Requested	For Correction	<input type="checkbox"/> RC	Prepare Reply
Circulate	For Your Information	<input type="checkbox"/> A	See Me <input type="checkbox"/> REPLY
Comment	Investigate	<input type="checkbox"/> A	Signature <input type="checkbox"/> FILE
Coordination	Justify		

REMARKS Our proposed decision on §303(d) is the FR notice, and a factsheet.

1. Pls. review with Bruce, Frank, Bill et.al. and provide any comments by April 2. Thanks.

2. Please give Ben Kor a heads up on this. Please give him a copy of this factsheet (enclosed) and ~~let~~ let him know that our Division Director or Deputy D.D. would be happy to discuss with him or the Board.

DO NOT use this form as a RECORD of approvals, recommendations, dispositions, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)

Dave Smith

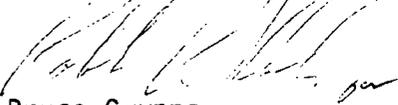
Room No.—Bldg.

Phone No.
415-744-2019

Memorandum

To: Dave Smith (W-3-2)
TMDL Coordinator
U.S. EPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Date: December 23, 1992



Bruce Gwynne
Environmental Specialist
Surveillance, Monitoring, and Planning Unit

From: California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd. Suite A
Santa Rosa, CA 95403

Subject: Request for Water Quality Information with respect to 303(d) listing

Per your request for information on water quality information for specific waterbodies in the North Coast Region, I have enclosed reports or other information for the water bodies as indicated on the attached list. Reports are in preparation summarizing water quality conditions for the Shasta River, Russian River, and Copco and Iron Gate reservoirs. Unless you specifically request, we are not including those raw data at this time, rather will send you those reports in January, 1993. I hope this information will assist you.

Not in draft

Should you have any questions, or if we can be of further assistance, please call me (707-576-2661), Bob Klamt (707-576-2693), or Frank Reichmuth (707-576-2694).

Enclosures

(303dinfo)

WaterbodyInformation and/or contact

Scott River and tributaries
(French, Kidder, Moffett Crks)

AFS, 1992
Two reports on sediment studies from KRBFTF

Garcia River

NCRWQCB staff letter; excerpts from
Jan Dirksen report on N. Fork (R&J
Timber consultant)

Greenwood Creek

Elk County Water District letter to
NCRWQCB

Little River

CDFG memo, 1992; NCRWQCB staff memo, 1992

Mad River

Watershed Erosion Investigation from DWR,
1982

Mattole River

CDFG letter to CDF

Grass Valley Creek

NCRWQCB Executive Officer's Summary Report;
Report by Bill Brock, 1989

Sproul(Sprowl) Creek

Evaluation of Conditions, CDFG, 1990

Grouse Creek
National Forest

Sediment Budget Report from Six Rivers

Tomki Creek

Cover sheet from 319(h) Exhibit "B";
also contact SCS, Ukiah (Tom Schott)

Willow Creek

Cover sheet from 319(h) Exhibit "B"; also
contact Six Rivers National Forest

Shasta River

Report in preparation

Klamath River

Report in preparation

Russian River

Report in preparation

Santa Rosa Creek

NCRWQCB graphs of 1985-90 data; more
data available on request

Albion River

Andrea Luna, Redwood Coast Law Center
(707) 937-2939, re: Louisiana-Pacific
Corp. cumulative impact report

Big River

Lots of THPs, some QW data @ NCRWQCB

Cottaneva Creek

Wendy Jones, CDFG, Ukiah

Eel River

CDFG, AFS

Eel River, South Fork

CDFG

Gualala River	Lots of THPs, some QW data @ NCRWQCB
High Prairie Creek	Lots of THPs, no QW data
Hollow Tree Creek	Lots of THPs, no QW data
Hoppaw Creek	Lots of THPs, no QW data
Hunter Creek	Lots of THPs, no QW data
Juan Creek	Lots of THPs, no QW data
Mark West Creek	NCRWQCB data available on request
Navarro River	AFS, 1992
Noyo River	Contact Wendy Jones, CDFG, Ukiah
Redwood Creek	Redwood National Park - sediment study; USGS
Salmon River	CDFG; USFS.
Trinity River, main and S. Fk.	USFS; USFWS; TRBFTF; Bob Franklin, Hoopa Tribe
Usal Creek	Lots of THPs, no QW data
Van Duzen River	CDFG

Abbreviations

AFS = American Fisheries Society
 CDF = California Department of Forestry & Fire Protection
 CDFG = California Department of Fish and Game
 KRBFTF = Klamath River Basin Fisheries Task Force
 NCRWQCB = N. Coast Regional Water Quality Control Board
 QW = water quality
 SCS = Soil Conservation Service
 THP = Timber Harvest Plan (administered by CDF)
 TRBFTF = Trinity River Basin Fisheries Task Force
 USFS = U.S. Forest Service
 USFWS = U.S. Fish and Wildlife Service
 USGS = U.S. Geological Survey

STATE WATER RESOURCES CONTROL BOARD

PAUL R. BONDERSON BUILDING
901 P STREET
P. O. BOX 100
SACRAMENTO, CALIFORNIA 95812-0100



916/657-0941
FAX 657-0932

OCT 28 1992

WATER QUALITY
CONTROL BOARD
REGION I

OCT 28 1992

- BK
- CCJ
- CFB
- CRT
- CWH
- CSW
- _____
- ALL STAFF
- BK PPL
- LR
- RB
- RD
- JS
- _____
- REPLY
- FILE

BAG

Ms. Catherine Kuhlman, Chief (W-3-2)
Water Management Division
U.S. Environmental Protection Agency,
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Dear Ms. Kuhlman:

CLEAN WATER ACT SECTION 303(d) LIST OF WATER BODIES

Thank you for your letter of September 24, 1992 in which you partially approved the State's Clean Water Act Section 303(d) report and list of water bodies.

You stated in a follow-up letter of September 28, 1992, that you need additional information regarding a large number of water bodies in order to determine whether some of them should be added to the State's list. You indicated that five criteria were used to select that set of water bodies for additional review. Those criteria relate to information contained in the State's Water Quality Assessment, definitions used to develop the Federal Section 131.11, 319 and 304(1) lists, and other recent water quality assessment reports.

Furthermore, you asked the State to review the list, based on the five criteria above, and add water bodies to the Section 303(d) list as appropriate. You noted that if EPA finds that additional waters must be added to the Section 303(d) list, EPA will do so.

The State Water Resources Control Board adopted a Section 303(d) list on May 18, 1992. Appropriate consideration of four of the five criteria preceded that action. The fifth criterion presumably refers to information that was not available at the time of adoption of the list. The proper forum for consideration of such new information is the next biennial review of the Section 303(d) list.

Ms. Catherine Kuhlman

-2-

The State does not intend to add water bodies to the Section 303(d) list before the next biennial review of the list in 1994.

If you have any questions on this subject, please contact Jesse M. Diaz, Chief of the Division of Water Quality, at 916/657-0756.

Sincerely,

Original Signed By:

Walt Pettit
Executive Director

bcc: David B. Cohen
Michael Perrone

Regional Board Executive Officers

Barbara L. Evoy, Chief
Program Control Unit

Memorandum

To : John Norton
Monitoring and Assessment Unit
State Water Resources Control Board

Date : February 6, 1991

William D. Winchester
Environmental Specialist III

From : California Regional Water Quality Control Board
North Coast Region - 1440 Guerneville Road
Santa Rosa, California 95401

Subject: Proposed Changes to the Water Quality Assessment (WQA)

North Coast Regional Board staff has reviewed the WQA proposal changes, dated January 2, 1991, and offer the following comments.

The change to the list of water body types would likely require a tremendous amount of additional work to the already completed WQA. If we are to change water body types at this late stage of the program, then each specific change needs to be justified as being necessary and responsive to Regional Board needs. The proposed changes are not an update, but for the most part a whole new program.

If lots of additional staff time to complete this were of no consequence, then we would ideally like to see a time dimension inserted into the bay, estuary, and lagoon definitions to accurately characterize and size the water bodies on a temporal basis. Also, for example, a portion of Humboldt Bay is affected by NPS discharges only after rainfall events, but is affected by a municipal discharge the rest of the time. Each of these water body types, excepting those which already have a statutory definition, would need to be defined in an understandable, unambiguous manner. Wetlands and open bays are two proposed WQA water body types for which a definition would be needed. For wetlands, we would need a significant new program in itself to help identify all these areas in the North Coast Region prior to characterization in fact sheets. In other words, what we are afraid of here is that we will be asked to develop factsheets on areas which still need a lot of definition and identification. As we have pointed out during the past WQA, we cannot credibly do this over a Region-wide basis without expending a lot of staff time investigating individual water bodies, and then having the fact sheets set out in a manner which contains information responsive to our needs.

Regarding the second proposal, structuring the assessment by hydrologic area is a good idea that builds on our desire to develop the WQA on a specific sub-watershed basis. Better water body definition in the WQA is ideally needed to make it more responsive to our programs. This second proposal, as we understand it, would not result in the need for additional staff time spent on the WQA. Is that a correct understanding? Please let us know.

Thank you for the opportunity to comment. Please call me if you have any questions.

State of California
Regional Water Quality Control Board
North Coast Region

Bruce A. Gwynne
November 19, 1991

EXECUTIVE OFFICER'S SUMMARY REPORT
9:00 a.m., December 11, 1991
Eureka City Council Chambers
531 K Street
Eureka, California

ITEM: 3

SUBJECT: Public Hearing to Consider Adoption of the 1991 Update of the Regional Water Quality Assessment for the North Coast Region.

DISCUSSION: Section 305(b) of the Federal Clean Water Act (CWA) establishes a process for reporting about the quality of the nation's water resources to the U.S. Environmental Protection Agency (EPA) and Congress. Each State, Territory, and Interstate Commission develops a program to monitor the quality of its surface and ground waters and report the current status of water quality every two years to the EPA on or before April 1 of every even year. This information is compiled into a biennial report to Congress. Additionally, various sections of the Clean Water Act require that the EPA maintain lists of water bodies which are regulated by those sections. States are expected to submit these lists either as part of or at the same time as the biennial section 305(b) reports.

In order to comply with listing requirements of the CWA, the State Water Resources Control Board (State Board) adopted the Water Quality Assessment (WQA) for California's surface, estuarine, and ground waters on February 1, 1989.

At this time, the Regional Boards are completing biennial reviews and updates to the WQA. Attached is a copy of the staff report and proposed 1991 Regional Water Quality Assessment for the North Coast Region. This document includes proposed changes to the 1990 version, described below.

1) Willow Creek (tributary to the Trinity River) has received funding for 319(h) nonpoint source restoration/mitigation efforts. Staff proposes to include Willow Creek in the Water Quality Assessment as an intermediate quality stream.

2) A section of the Shasta River (tributary to the Klamath River) has been designated as impaired do to impairment of fish habitat from low dissolved oxygen and high water temperatures.

3) Barlow Creek (tributary to Atascadero Creek, thence Green Valley Creek, thence the Russian River) was included on the 304(L), 303(d) and 319 lists due to impairment of fish and wildlife habitat from industrial waste discharges. Enforcement and follow-up actions have brought about the successful abatement of the impairment. Staff proposes to remove Barlow Creek from the 319 list and request that State Board remove it from the 303(d) list.

4) The ocean off of Samoa Peninsula has been listed as impaired and placed on the 304(1) Short List due to dioxin from the pulp mills. This site is subject to the appropriate actions specified under Section 303(d), specifically the development of wasteload allocations. This has been accomplished through the NPDES permit process and other regulatory requirements being applied to all known significant point source discharges to this area. Staff proposes to request that the State Board remove the ocean off of Samoa Peninsula from the 303(d) list.

PRELIMINARY STAFF

RECOMMENDATION: Approve Resolution 91-183, which adopts the updated WQA as proposed.

(WQAEOSR)

HEARING PROCEDURE

Call meeting to order.

Opening statements: This is the time and place for the hearing by the California Regional Water Quality Control Board, North Coast Region, to consider approval of the 1991 Water Quality Assessment. This item has been properly noticed.

The purpose of this hearing is to take evidence concerning:

1. Waterbody conditions and listings in the proposed Assessment.
2. To consider approval of the Assessment for submission to the State Board and EPA.

All relevant evidence which may pertain to this matter must be introduced at this hearing.

The order of presentation at this hearing will be as follows:

1. Staff presentation.
2. Representatives of affected Governmental Agencies.
3. Other interested persons.
4. Summation or statement by parties.

Cross examination of each witness by parties who have entered their appearances, staff members and Board Members will be allowed upon the completion of the direct testimony of each witness. The Board and staff counsel may ask questions to clarify the testimony of a witness at any time.

This hearing will not be conducted according to the technical rules of evidence. The Board will accept any evidence or testimony which is reasonably relevant to the following issues:

1. Waterbody conditions as identified in the Assessment.
2. Water listings in accordance with provisions of the Clean Water Act.

Will all those who expect to give testimony in this matter please stand, raise you right hand and take the following oath:

Do you swear or affirm that you will tell the truth in this matter?

At this time we will start with the staff presentation.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION**1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95403(707) 576-2220
October 4, 1991

Mr. Charles Abbott
Yurok Transition Team
American Fisheries Society
P.O. Box 218
Klamath, CA 95548

Dear Mr. Abbott:

SUBJECT: UPDATE OF THE NORTH COAST REGION'S WATER QUALITY ASSESSMENT

The North Coast Regional Water Quality Control Board will be scheduling a hearing in order to update their regional Water Quality Assessment (WQA) before the end of the year. Regional Board staff will be reviewing all available information over the next month in order to develop recommended changes to the WQA. Of special interest will be possible changes to various Federal lists [e.g., Clean Water Act Sections 304(l) and 303(d)].

We encourage your agency to provide the Regional Board with information on the water quality conditions of water bodies for which you have current data. We specifically request additional information on the North Coast Region water bodies which your agency requested the U.S. Environmental Protection Agency to place on its 304(l) list. These water bodies are identified on the enclosed list. No specific data have been received from your agency regarding these water bodies. Before our Regional Board staff can conduct a review, we need more detailed background information, including water body specific data, to explain your agency's rationale for proposed listing of these waters. Sources of the problems and areal extents of the waters affected (in miles or acres) must be described. We are requesting water body specific information (e.g., pollutant, concentration observed, source, areal extent, beneficial use affected, and type of habitat degradation) for the enclosed water bodies which your agency proposed for listing.

Please send your information to this office as soon as possible. Staff will be preparing a report for distribution on November 8, 1991. We would appreciate as much review time as possible to ensure that your data are incorporated into the public report.

Please contact Bruce Gwynne or myself with any questions at (707)576-2220.

Sincerely,

Robert Klamt, Supervisor
Surveillance, Monitoring, and Planning Unit

RRK:lmf/wqalists

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION**

1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95403
(707) 576-2220

October 4, 1991



Mr. Patrick Higgins
Humboldt Chapter
America Fisheries Society
1271 Fieldbrook Road
Arcata, CA 95521

Dear Mr. Higgins:

SUBJECT: UPDATE OF THE NORTH COAST REGION'S WATER QUALITY ASSESSMENT

The North Coast Regional Water Quality Control Board will be scheduling a hearing in order to update their regional Water Quality Assessment (WQA) before the end of the year. Regional Board staff will be reviewing all available information over the next month in order to develop recommended changes to the WQA. Of special interest will be possible changes to various Federal lists [e.g., Clean Water Act Sections 304(1) and 303(d)].

We encourage your organization to provide the Regional Board with information on the water quality conditions of water bodies for which you have current data. We specifically request additional information on the North Coast Region water bodies which your organization requested the U.S. Environmental Protection Agency to place on its 304(1) list. These water bodies are identified on the enclosed list. No specific data have been received from your organization regarding these water bodies. Before our Regional Board staff can conduct a review, we need more detailed background information, including water body specific data, to explain your organization's rationale for proposed listing of these waters. Sources of the problems and areal extents of the waters affected (in miles or acres) must be described. We are requesting water body specific information (e.g., pollutant, concentration observed, source, areal extent, beneficial use affected, and type of habitat degradation) for the enclosed water bodies which your organization proposed for listing.

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Please contact Bruce Gwynne or myself with any questions at (707)576-2220.

Sincerely,

Robert Klamt, Supervisor
Surveillance, Monitoring, and Planning Unit

RRK:lmf/wqalists

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION**

1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95403
(707) 576-2220

October 4, 1991



David Hoopaugh
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Dear Mr. Hoopaugh:

SUBJECT: UPDATE OF THE NORTH COAST REGION'S WATER QUALITY ASSESSMENT

The North Coast Regional Water Quality Control Board will be scheduling a hearing in order to update their regional Water Quality Assessment (WQA) before the end of the year. Regional Board staff will be reviewing all available information over the next month in order to develop recommended changes to the WQA. Of special interest will be possible changes to various Federal lists [e.g., Clean Water Act Sections 304(1) and 303(d)].

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Please contact Bruce Gwynne or myself with any questions at (707)576-2220.

Sincerely,

Robert Klamt, Supervisor
Surveillance, Monitoring, and Planning Unit

RRK:lmf/wqalists

Enclosure

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION**

1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95403
(707) 576-2220

October 4, 1991



Mr. Wayne W. White
U.S. Fish and Wildlife Service
2800 Cottage Way, Room E1803
Sacramento, CA 95825

Dear Mr. White:

SUBJECT: UPDATE OF THE NORTH COAST REGION'S WATER QUALITY ASSESSMENT

The North Coast Regional Water Quality Control Board will be scheduling a hearing in order to update their regional Water Quality Assessment (WQA) before the end of the year. Regional Board staff will be reviewing all available information over the next month in order to develop recommended changes to the WQA. Of special interest will be possible changes to various Federal lists [e.g., Clean Water Act Sections 304(1) and 303(d)].

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Please send your information to this office as soon as possible. Staff will be preparing a report for distribution on November 8, 1991. We would appreciate as much review time as possible to ensure that your data are incorporated into the public report.

Please contact Bruce Gwynne or myself with any questions at (707)576-2220.

Sincerely,

Robert Klamt, Supervisor
Surveillance, Monitoring, and Planning Unit

RRK:lmf/wqalists

Enclosure

EPA Summary Spreadsheet April 15, 1991

Waterbody	State list #	RB #	Identified by			Listed by SWRCB	Problem Description							
			USFWS	COFG	AFS		Depressed Populations	Fish Kills	Degraded Habitat	Degraded Water Quality	High Temp.	Low Flow or Lake Level	Poor Fish Passage	Reduced Spawning
Sac/San Joaquin Delta		2&5	X			X		X	X	X	X			
Ah Pah Creek	45	1			X		X		X					
Albion River	46	1		X				X	X					
Big Creek	1	1		X						X	X			
Big River	47	1	X	X				X	X					
Big Salmon Creek	2	1		X					X					
Big Sulfur Creek	48	1		X				X	X	X	X			
Black Butte River	49	1		X	X		X	X	X	X	X			
Browns Creek	3	1			X					X				
Cold Creek (Mendo. Co.)	4	1		X					X					
Cold Creek (Sisk. Co.)	5	1		X						X	X			
Cottaneva Creek	6	1		X					X					
Cottonwood Creek	7	1		X						X	X			
Dean Creek	50	1			X			X						
Eel River	8	1	X	X					X	X	X			
Eel River Estuary	51	1			X			X						
Estero de Americano		1	X	X		X		X	X	X				
Etna Creek	9	1		X						X	X			
Forsythe Creek	52	1		X				X						
French Creek	10	1		X						X	X			
Garcia River	11	1		X					X					
Gilbert Creek	12	1		X						X	X			
Green Valley Creek	13	1		X					X					
Greenwood Creek	14	1		X					X					
Gualala River	53	1	X	X				X	X					
Hardy Creek	15	1		X					X					
Hayfork Creek	16	1		X						X	X			
Hollow Tree Creek	17	1		X					X					
Humboldt Bay NWR	18	1	X						X					
Juan Creek	19	1		X					X					
Julias Creek	20	1		X					X					
Kidder Creek	21	1		X						X	X			
Klamath River	22	1	X						X	X				

Waterbody	State List #	RB #	Identified by			Listed by SURCB	Problem Description							
			USFWS	CDFG	AFS		Depressed Populations	Fish Kills	Degraded Habitat	Degraded Water Quality	High Temp.	Low Flow or Lake Level	Poor Fish Passage	Reduced Spawning
Klamath River Estuary	34	1			X				X					
Laguna de Santa Rosa		1	X	X		(X)			X	X	X			
Lake Mendocino	23	1		X						X				
Lake Pillsbury		1		X						X				
Little Juan Creek	25	1		X						X				
Little Shasta River	26	1		X							X	X		
Lower Klamath NWR	27	1	X							X				
Luffenholtz Creek	28	1		X							X	X		
Mad River	55	1	X		X				X	X				
Mad River Estuary	56	1			X				X					
Mark West Creek	57	1		X					X	X	X	X		
Mattole Estuary	58	1			X		X		X					
Mattole River	59	1	X						X					
McGarvey Creek	60	1			X		X							
Mill Creek (Humb. Co.)	29	1		X							X	X		
Mill Creek (Sisk. Co.)	30	1		X							X	X		
Hoffett Creek	61	1			X				X					
Navarro River	62	1	X	X					X	X				
Noyo River	63	1	X	X					X	X				
Omagar Creek	64	1			X		X		X					
Outlet Creek Tributaries	31	1		X						X				
Peacock Creek	32	1		X							X	X		
Pelletreau Creek	65	1			X				X					
Post Creek	66	1			X				X					
Redwood Creek	33	1	X						X					
Redwood Creek Estuary	68	1			X		X							
Rowdy Creek	34	1		X							X	X		
Russian River	69	1	X	X					X	X	X			X
S Fork Trinity River	70	1			X		X		X					
Salt River	71	1			X		X		X	X				
Santa Rosa Creek	35	1		X					X	X	X	X		
Scott River	36	1		X	X						X	X		
Shackleford Creek	37	1		X							X	X		
Shasta River	38	1	X	X						X	X	X		
Smith River	73	1	X						X					

Waterbody	State list #	RB #	Identified by			Listed by SWRCB	Problem Description								
			USFWS	COFG	AFS		Depressed Populations	Fish Kills	Degraded Habitat	Degraded Water Quality	High Temp.	Low Flow or Lake Level	Poor Fish Passage	Reduced Spawning	
Tomki Creek	39	1		X					X						
Trinity River	74	1	X					X			X	X	X		
Tule Lake NWR	40	1	X							X					
Usal Creek	41	1		X						X					
Van Duzen River	75	1	X					X							
Wildcat Creek	42	1		X							X	X			
Willow Creek	43	1		X							X	X			
Windsor Creek	76	1		X				X		X	X	X			
Yreka Creek		1		X							X	X			
Alameda Creek		2	X	X		X		X		X	X	X	X		
Carneros Creek	1	2		X						X					
Coyote Creek		2	X												
Drakes Estero	2	2		X						X	X				
Dry Creek	14	2		X				X		X					
Guadalupe River		2	X			X				X			X		
Huichica Creek	3	2		X						X					
Lagunitas Creek		2	X	X		X		X		X	X	X	X		
Lake Herman		2		X		X				X					
Lake Madigan	4	2		X						X					
Lake Temescal	5	2		X						X					
Ledgewood Creek	6	2		X						X					
Los Trampas Creek	7	2		X						X					
Napa River		2	X	X		X		X			X				
Nicasio Reservoir	15	2		X				X		X	X	X			
Petaluma River		2	X	X		X		X		X	X	X	X		
Pinole Creek	8	2		X						X					
Rector Creek	9	2		X						X					
Richardson Bay		2	X			X				X					
San Pablo Reservoir	10	2		X						X					
Sonoma Creek		2		X		X		X		X	X	X	X		
South SF Bay		2	X	X		X				X			X		
Suisun Bay		2	X			X							X		
Suisun Marsh		2	X			X							X		
Sulfur Creek (Napa Co.)	11	2		X						X					

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of June 15, 1967, Consolidated Case Number 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

Oct. 24, _____

all in the year 19 91

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California,

this 24 day of Oct., 19 91

Janet Subinas
Signature

This space is for the County Clerk's Filing Stamp

Proof of Publication of

Notice of public hearing to consider adoption of amendments to the water quality assessment

for the north coast region

California Water Quality Control Board
North Coast Region
1440 Guerneville Road
Santa Rosa, California
95403
(707) 576-2220

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF AMENDMENTS TO THE WATER QUALITY

ASSESSMENT FOR THE NORTH COAST REGION: CONTACT PERSON:
Bruce Gwynne, Telephone No. (707) 576-2220

The California Regional Water Quality Control Board, North Coast Region, will hold a public hearing to consider approval of the update and review of the Regional Water Quality Assessment (Assessment) for surface waters, ground waters, and coastal waters in the North Coast Region, as required under Section 305(b) of the Federal Clean Water Act. (Act).

BACKGROUND

On January 25, 1990, the North Coast Regional Quality Control Board adopted an amended version of the Assessment adopted by the State Water Resources Control Board on February 1, 1989. Section 305(b) requires that the Regional and State Boards update the Assessment every two years. North Coast Regional Board staff have completed an update of the Assessment for waters in the North Coast and will present it to the Regional Board for approval at the public hearing. Water Quality Assessments approved by Regional Boards are one element of the State Board's Clean Water Strategy. The objective of the Clean Water Strategy is to focus water quality control efforts on California's most significant and important water resources.

The public hearing on this matter has been scheduled for Wednesday, December 11, 1991, at the Eureka City Council Chambers, 331 K Street, Eureka, at 1:00 a.m. or as soon thereafter as possible, or as announced in our Board agenda to be mailed by November 21, 1991. The Regional Board is soliciting comments on this update of the Assessment. Interested persons are encouraged to submit to the Regional Board office any written comments or recommendations so that a written response may be prepared for distribution and review at the December 11, 1991, public hearing. Oral testimony may be limited at the public hearing in order to accommodate all speakers who wish to testify. The total time of testimony, or length of testimony allotted each speaker, may be limited based on the indicated number of speakers and available time. All interested persons will be given an opportunity to speak and respond to material being presented. However, the Regional Board will encourage speakers to avoid repetitive testimony and to briefly summarize written testimony. Copies of the proposed Regional Water Quality Assessment will be available November 8, 1991. All related documents are on file and may be reviewed at the Regional Board office during regularly scheduled file access times.
Benjamin D. For
Executive Officer

STATE WATER RESOURCES CONTROL BOARD

Pollutant/Source Summary For Water Quality Limited Segments
RIVERS AND STREAMS

Date: 07/05/91

Page: 17

Regional Board	Water Body Name	Statewide Resource Value	Condition	Source(s)	Pollutant(s)	Areal Extent
				Regulation/Modification, Rangeland, Other Nonpoint Sources		
			T3	Onsite Wastewater Systems	Nutrients, Nitrates, Bacteria	1
			T4	Waste Storage/Storage Tank Leaks	Priority Organics, Oil and Grease	1
					SILVER	0
1	LAGUNA DE SANTA ROSA	3	T3	Manure Lagoons, Pasture Land, Animal Holding/Management Areas, Channelization, Other Nonpoint Sources	Ammonia, Organic Enrichment/DO, Nutrients, Habitat Alterations	26
			T3	Municipal	Bacteria, Suspended Solids, Organic Enrichment/DO	1
						0
5	STANISLAUS RIVER (LOWER)	3	T3	Agriculture	Pesticides, GROUP A, TOXAPHENE, DDT, Chlorine	48
			T3	Source Unknown	Unknown Toxicity	48
						0
						0
						0
6	CARSON RIVER, E FK	3	T3	Onsite Wastewater Systems, Rangeland, Other Nonpoint Sources	pH, Ammonia	1
			T3	Mine Tailings, Mill Tailings, Natural, Other Nonpoint Sources	Metals, CHROMIUM, SILVER, ZINC	46
			T3	Mine Tailings, Mill Tailings, Upstream Impoundment, Other Nonpoint Sources	Metals, Siltation, Other Inorganics, pH, Flow Alteration	4
			T2	Resource Extract/Explore/Develop, Land Development, Rangeland, Other Nonpoint Sources	Siltation	46
			T3	Onsite Wastewater Systems, Other Nonpoint Sources	Nutrients, Nitrates	7
			T5	Flow Regulation/Modification	Flow Alteration	1
				Resource Extract/Explore/Develop	pH	0
				Resource Extract/Explore/Develop	Organic Enrichment/DO	0
				Resource Extract/Explore/Develop	Siltation	0
				Resource Extract/Explore/Develop	Trace Elements	0
					Other Inorganics	0
2	PETALUMA RIVER	3	I	Agriculture, Municipal	Bacteria, Nutrients	25
			I	Source Unknown	Metals	25
			I	Source Unknown	Organic Enrichment/DO	25
			T	Agriculture, Rangeland, Land Development	Siltation	25
			T	Flow Regulation/Modification	Flow Alteration	25
2	NAPA RIVER	3	I	AGAM, Municipal	Bacteria	55
			I	Agriculture, Land Development	Nutrients, Siltation	55
			I	Urban Runoff	Bacteria, Metals	55

WATERBODIES EPA HAS PLACED ON THE 304(1) LONG LIST WHICH THE
STATE WATER RESOURCES CONTROL BOARD DID NOT PROPOSE FOR LISTING

- Region 1:
1. Big Creek
 2. Big Salmon Creek
 3. Browns Creek
 4. Cold Creek (Mendocino County)
 5. Cold Creek (Siskiyou County)
 6. Cottaneva Creek
 7. Cottonwood Creek
 8. Eel River
 9. Etna Creek
 10. French Creek
 11. Garcia River
 12. Gilbert Creek
 13. Green Valley Creek
 14. Greenwood Creek
 15. Hardy Creek
 16. Hayfork Creek
 17. Hollow Tree Creek
 18. Humboldt Bay National Wildlife Refuge
 19. Juan Creek
 20. Julias Creek
 21. Kidder Creek
 22. Klamath River
 23. Lake Mendocino
 24. Lake Pillsbury
 25. Little Juan Creek
 26. Little Shasta River
 27. Lower Klamath National Wildlife Refuge
 28. Luffenholtz Creek
 29. Mill Creek (Humboldt County)
 30. Mill Creek (Siskiyou County)
 31. Outlet Creek Tributaries
 32. Peacock Creek
 33. Redwood Creek
 34. Rowdy Creek
 35. Santa Rosa Creek
 36. Scott River
 37. Shackelford Creek
 38. Shasta River
 39. Tomki Creek
 40. Tule Lake National Wildlife Refuge
 41. Usal Creek
 42. Wildcat Creek

Memorandum

Planning, Water Quality
: WQA
CERCLA, TMDL

To: Jesse Diaz
State Water Resources Control Board
Division of Water Quality

Date: April 5, 1994



Benjamin D. Kor
Executive Officer

From: California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd. Suite A
Santa Rosa, CA 95403

Subject: Transmittal of Water Quality Assessment

On February 24, 1994, the North Coast Regional Water Quality Control Board held a public hearing to consider an update of the Regional Water Quality Assessment (WQA) in compliance with the Clean Water Act Section 305(b). The Board approved the changes recommended by Regional Water Board staff. In addition, public testimony was received regarding the Russian River, Ten Mile River, and named tributaries to the South Fork Eel River. The Regional Water Board requested that staff revisit those streams in two years. Additional public testimony was received in support of the new 303(d) listings being affirmed by the Regional Water Board. Enclosed is the Executive Officer's Summary Report and Resolution 94-36 approving the WQA. Attachment One is the 1994 WQA. Changes from 1992 are summarized in Attachment Two.

BDK:BAG:bp\wqatrans.94

cc: Michael Perrone
Nancy Richard

**Interested Parties
Mailing List for Water
Quality Assessment '94**

Diane Paget, Friends of the
Navarro Watershed
P.O. Box 861
Boonville, CA 95415

Johanna Burkhardt
Mendocino/Lake Sierra Club

Redwood Coast Watersheds
Alliance
21520 Orr Springs Road
Ukiah, CA 95482

Friends of Fort Bragg
P.O. Box 198
Fort Bragg, CA 95437

Ten Mile River Watershed
Association
P.O. Box 25
Fort Bragg, CA 95437

Mark A. Massara
Sierra Club
1642 Great Highway
San Francisco, CA 94122

Redwood Coast Watersheds
Alliance, Inc.
P.O. Box 90
Elk, CA 95432

Mendocino Environmental
Center
106 W. Standley Street
Ukiah, CA 95482

Carol Shiler
USFWS
2600 S.E. 98th Avenue
Portland, OR 97266

RWQCB
Colorado River Basin Region
73-720 Fred Waring Dr., #100
Palm Desert, CA 92260

Brenda Adelman
RRWPC
P.O. Box 501
Guerneville, CA 95446

RWQCB
Lahontan Region
2092 Lake Tahoe Blvd.
South Lake Tahoe, CA 9615

(bruce\wqatrans.add)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 26 1993

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Guidance for 1994 Section 303(d) Lists

FROM: Geoffrey H. Grubbs, Director
Assessment and Watershed Protection Division

A handwritten signature in black ink, appearing to read "G. Grubbs", written over the typed name of the sender.

TO: Water Management Division Directors
Regional TMDL Coordinators
Regions I - X

This memo discusses minimum requirements for the April, 1994, State lists of waterbodies requiring TMDLs under section 303(d) of the Clean Water Act (CWA). This memorandum provides guidance only and builds on previous guidance and reflects the policies and requirements of section 303(d) and the Water Quality Planning and Management regulation at 40 CFR Part 130. This guidance does not establish or affect legal rights or obligations. Decisions in any particular case will be made by applying the CWA and implementing regulations. This guidance is intended to help States and Regions meet the overriding program goals outlined below. It also addresses specific issues that arose during development of the 1992 lists.

The 1992 listing process was very successful. States and Regions used existing data in a very compressed time frame to develop lists of waterbodies requiring TMDLs. States and Regions worked jointly to assure that all requirements, especially those related to public participation, were complied with properly. Based on these lists, States started establishing TMDLs targeted for development during the 1992-1994 biennium.

Development of 1994 section 303(d) lists should build on this success. The section 303(d) list provides a comprehensive inventory of waterbodies impaired by all sources, including point sources, nonpoint sources, or a combination of both. This inventory is the basis for targeting waterbodies for watershed-based solutions, and the TMDL process provides the analytical framework to develop these solutions. Indeed, the use of TMDLs and the TMDL process is becoming an increasingly vital part of a growing number of State programs. The development of TMDLs and the process used to arrive at a TMDL is the technical backbone of the Watershed Protection Approach. Similarly, as larger numbers of permits are written that incorporate water quality-based effluent limits, the position of TMDLs as a keystone in the point source control



program is strengthened. Finally, the applicability of the TMDL process to other than chemical stressors, such as degraded habitat and the resulting loss of healthy, balanced ecosystems, is increasingly being realized.

The 1992 listing process was the beginning of a much wider role for TMDLs and the 1994 listing process will continue to improve our ability to integrate solutions to water quality problems on a watershed basis. The three overriding national TMDL program goals for 1994 are:

1. *Develop fully approvable section 303(d) waterbody lists;*
2. *Integrate the section 303(d) listing process more completely into other State program activities, especially as it relates to the Watershed Protection Approach and the targeting of high priority watersheds; and*
3. *Assure consistent application of national §303(d) requirements, especially with regard to public involvement in the 303(d) list development process.*

These goals are discussed below.

1. DEVELOP FULLY APPROVABLE SECTION 303(d) LISTS

Development of fully approvable section 303(d) lists involves a number of considerations including: a) section 303(d) list development requirements; b) availability of data used to develop section 303(d) lists; c) relationship of section 303(d) lists to other CWA assessment and listing requirements; d) unassessed waterbodies; e) timing and content of section 303(d) submissions; and f) EPA review and approval of section 303(d) lists.

Question 1a. *What are the requirements for including waterbodies on the section 303(d) list?*

Section 303(d) requires that States develop a list of waterbodies that need additional work beyond existing controls to achieve or maintain water quality standards. The additional work necessary includes the establishment of TMDLs. The TMDL process provides an analytical framework to identify the relative contributions of each source to the impairment. The TMDL identifies the sources and causes of pollution or stress, e.g., point sources, nonpoint sources, or a combination of both, and establishes allocations for each source of pollution or stress as needed to attain water quality standards.

Waterbodies that do not or are not expected to meet water quality standards after implementing Best Practicable Technology (BPT), Best Available Technology (BAT), secondary treatment, and New Source Performance Standards (NSPS), as described in sections 301 and 306 of the CWA and defined under EPA regulations are water quality-limited. Not all water quality-limited waterbodies, however, must be included on the section 303(d) list. The Water Quality Planning and Management regulation (40 CFR Part 130) provides that waters need not be included on a section 303(d) list if other Federal, State, or local requirements have or are expected to result in the attainment or maintenance of applicable water quality standards.

Regions may choose to advise States to keep waterbodies on the section 303(d) list, notwithstanding establishment of an approvable TMDL, until water quality standards have been met. This approach would keep waterbodies on the section 303(d) list for which TMDLs have been approved but not yet implemented, or approved and implemented, but for which water quality standards have not yet been attained. Some Regions, on the other hand, may choose to advise their States to remove waterbodies from the section 303(d) list once a TMDL has been approved and track and manage TMDL activities and the attainment of water quality standards through other program functions. Under this approach, however, the waterbody should be returned to the section 303(d) list at any time that the approved TMDL and associated controls are found to be inadequate to lead to attainment of water quality standards, or if the controls fail due to incomplete implementation. EPA supports the use of either approach to manage State TMDL activities.

EPA believes that the following general strategy is useful for development of section 303(d) lists.

1. Identify water quality-limited waterbodies, i.e., waterbodies that will not or are not expected to meet water quality standards after the application of technology-based controls required by CWA sections 301(b) and 306.
2. Review water quality-limited waterbodies and eliminate waterbodies from consideration for listing under section 303(d) for which enforceable Federal, State, or local requirements will result in the attainment of applicable water quality standards.
3. Remaining waterbodies constitute the list submitted pursuant to section 303(d).

Several issues arose during the development of 1992 section 303(d) lists that require clarification. A number of States initially failed to list any waterbodies impaired by nonpoint sources. Some States incorrectly asserted that since best management practices (BMPs) or Coastal Zone Act Reauthorization Amendments (CZARA) management measures had not yet been established or implemented, a determination of whether or not the waterbody was water quality-limited could not be made, and waterbodies were omitted from the section 303(d) list.

Lists established under section 303(d) must include all waters for which existing pollution controls or requirements are inadequate to provide for attainment and maintenance of water quality standards. Accordingly, an impaired waterbody cannot be excluded from the section 303(d) list on the basis that required controls have not yet been established. However, if BMPs or CZARA management measures have been established or implemented and water quality standards have been attained or are expected to be attained in the near future, then the waterbody need not be included on the section 303(d) list.

Similarly, a question arose concerning the exclusion of impaired waterbodies from the section 303(d) list where TMDLs have not been completed but enforceable activities are reasonably expected to result in the attainment of applicable water quality standards in the near future. If compliance with water quality standards is to be attained through new effluent limits in permits for point source discharges, it can be assumed that water quality standards will be attained in the near future through established permitting mechanisms. Closer scrutiny is justified, however, where needed load reductions are to be attained through additional nonpoint source controls. In such

cases, for the purposes of the 1994 listing process, "the near future" should normally be viewed as prior to the required date for submission of the 1996 section 303(d) list. This should provide adequate time to complete any planning and implementation of nonpoint source control actions. Thus, if planned nonpoint source controls are not expected to lead to attainment of water quality standards by 1996, the water quality-limited waterbody should be included on the 1994 section 303(d) list.

Therefore, the implementation of an enforceable control does provide a rationale for not including a water quality-limited waterbody on the section 303(d) list if the required control is: (1) enforceable, (2) specific to the pollution/stressor problems, and (3) stringent enough to lead to attainment of water quality standards. Further, if the required control has not yet been implemented, a schedule for timely implementation of the control should be provided by the State. The difference, of course, is that the waterbody is not included on the list of waterbodies requiring TMDLs because an alternative method of achieving water quality standards exists.

Finally, a related question arose with respect to threatened waters. The TMDL guidance clearly states that the identification of threatened waters is an important part of the TMDL process and that threatened waters may be placed on the 303(d) list. Threatened waters are those waters that fully support their designated uses but that may not fully support uses in the future (unless pollution control action is taken) because of anticipated sources or adverse pollution trends. Threatened waters may also include high quality waters (e.g., Outstanding National Resource Waters) that may be potentially degraded by unregulated sources or stressors. By placing threatened waters on the section 303(d) list, States will: (1) be consistent with 40 CFR Part 130.7(c)(1)(ii) which requires that TMDLs be established for all pollutants that prevent or are expected to prevent water quality standards from being achieved; (2) be better able to maintain and protect existing water quality; and (3) meet EPA objectives to support State collection of data on impacted and threatened waters.

Question 1b(i). *What data are needed to include a waterbody on the section 303(d) list?*

In developing the 1992 submissions States used existing readily available data and information and best professional judgement to determine which waterbodies should be included on the section 303(d) list. This general approach should be followed in 1994. States are expected to use a combination of the most reliable databases, best professional judgement, and the best available information to develop section 303(d) lists. In addition, in 1994 greater use of predictive water quality modeling results should be made. EPA expects that this mix of databases, evidence, and best professional judgement will vary from State to State.

There are a number of sources that can be used to help determine whether a particular waterbody belongs on the section 303(d) list. These include section 305(b) reports, Waterbody System information, toxics chemical release inventory (TRI) data, CWA section 314 and 319 assessments, USGS streamflow information, STORET data, fish consumption advisory information, anecdotal information and public reports, and other State and Federal databases. States should use the best available information in making section 303(d) list determinations.

Question 1b(ii). *What type of information should be considered in deciding whether to include a specific waterbody on the section 303(d) list?*

Determining how much data and information are adequate to include a waterbody on the section 303(d) list is a deliberative process involving judgement. Appendix C of the 1991 TMDL guidance provides a list of screening categories that States should use to identify water quality-limited waters. Examples of the type of data and information that should be used in making this determination are provided below.

- Evidence of a numeric criterion violation. Example: Ambient monitoring data demonstrates exceedance of the State's ammonia criteria.
- Beneficial use impairment. Listing a waterbody due to beneficial use impairment requires information that shows the use is not being maintained and that this failure is due to degraded water quality. Example: A waterbody designated as a cold water fishery has exhibited a documented decline in fish population. The population decline is due to the existence of sediment deposits on the stream bottom which inhibit or preclude spawning.
- Evidence of a narrative criterion violation. Example: Biological assessment demonstrates that a loss of biological integrity has occurred, in violation of a State's biological criterion.
- Technical analyses. Example: Predictive modeling or Rapid Bioassessment Protocol results that show that criteria will be violated or beneficial uses will not be maintained.
- Impairment demonstrated through other CWA mechanisms. Example: If a waterbody is included on a section 314 or 319 assessment, or is determined to be impaired under section 305(b), it should be reviewed for possible inclusion on the section 303(d) list.
- Other information sources. Other sources that support listing based on best professional judgement include information from the public participation process and information regarding the efficacy of existing control requirements to be implemented in the near future.

Question 1(b)(iii). *Are biological data that indicate impairments sufficient to support listing a water under section 303(d)?*

As noted above, biological data can be used to support listing a waterbody on the section 303(d) list. This is consistent with the use of biological assessment in EPA's section 305(b) guidelines.

Biological assessments can provide compelling evidence of water quality impairment because they directly measure the aquatic community's response to pollutants or stressors. Biological assessments and biological criteria address the cumulative impacts of all stressors, especially habitat degradation, loss of biological diversity, and nonpoint source pollution. Biological information can

help provide an ecologically based assessment of the status of a waterbody and as such can be used to decide which waterbodies need TMDLs.

Question 1c. *What is the relationship between section 303(d) listed waterbodies and other CWA assessment activities?*

There are other CWA requirements that require assessments and analyses similar to section 303(d). The most prominent of these are the section 305(b) Report and section 319 assessments.

Section 303(d) lists approved in 1994 should be consistent with these other lists and assessments as compiled and submitted by the States, particularly with regard to the section 305(b) Report because it will generally be submitted at the same time as the section 303(d) list. States and Regions should review potential section 303(d) waterbodies in light of the information contained in these other lists and assessments. To the extent the lists are different, the administrative record for an EPA approval should provide a justification for the differences.

Question 1d. *What about unassessed waterbodies?*

Waterbodies for which there are no physical, chemical, or biological information available should not be included on section 303(d) lists. However, EPA encourages States to increase the number of waterbodies actually assessed. EPA also expects that as waterbodies are identified for which there are insufficient data or data of questionable validity to determine whether the waterbody should be included on the 303(d) list, States will, to the maximum extent possible, make plans to collect additional information so that better and more informed 303(d) determinations can be made.

Question 1e(i). *When are 303(d) lists due to EPA?*

States must submit the next section 303(d) list (including pollutant or stressor identification, priority ranking and identification of waterbodies targeted for TMDL development during the next two years) on April 1, 1994, and every two years after that. Lists may be submitted in conjunction with section 305(b) reports.

In order to allow for a thorough review of State 303(d) lists, it is very important that a draft list be received by EPA prior to submission of a final list. EPA can then transmit comments on the draft section 303(d) list to the State, and revisions can be incorporated prior to providing for public comment. Following completion of public participation requirements, the list should be submitted to EPA as the final 303(d) list.

Question 1e(ii). *What kind of documentation is required to support a State list submission?*

States should submit adequate documentation to support the listing of waterbodies. Documentation should include a general description of the methodologies used to develop the list, a description of the data and information used to identify water quality-limited waters, and a rationale for any decision not to use any one of the categories of information sources listed in

Appendix C of the 1991 TMDL guidance. EPA expects that the 1994 listing methodologies will build upon the methods used to develop the 1992 lists.

EPA may request that the State provide additional information before an approval/disapproval decision is made. Two ways that States may prepare for requests for the information used to list waterbodies may include: (1) keeping an ongoing file or factsheet on each listed waterbody; or (2) waiting for a request for additional information, then assembling the information necessary to respond. While the second option may involve less work in the short term, it is likely that a file of information for a waterbody will be useful and necessary when TMDL development begins.

Question 1e(iii). *What other information would EPA like to receive?*

In addition to the 303(d) list, EPA is requesting that with each 303(d) list submission, States also include a brief description of the status of TMDL activities on waters that were targeted for development in previous two-year cycles. For example, with the 1994 303(d) list submissions, EPA should receive status reports on the TMDL activities taking place on the waters that were targeted for TMDL development during the 1992-1994 biennium. Similarly, in 1996 EPA should receive updates on the TMDL activities taking place on the waters that were targeted for TMDL development during the 1992-1994 and the 1994-1996 biennium.

Question 1f(i). *What kind of action can EPA take on a 303(d) list?*

States should work with EPA early in the development of section 303(d) lists to achieve complete, fully approvable list submissions by April 1 of even numbered years. EPA can take four actions on a State's section 303(d) list: (1) approval; (2) disapproval; (3) conditional approval; or (4) partial approval/partial disapproval.

Approval. If EPA determines that a State list (including pollutant or stressor identification, priority ranking, and identification of waterbodies targeted for TMDL development during the next two years) meet all section 303(d) requirements, EPA will notify the State of its approval in writing.

Disapproval. If EPA determines that a State list (including pollutant or stressor identification, priority ranking, and identification of waterbodies targeted for TMDL development during the next two years) substantially fails to meet the requirements of section 303(d) and 40 CFR Part 130, EPA will disapprove the State submission. Following a disapproval, EPA will identify waters where TMDLs are required, pollutants or stressors causing the impairment, and establish priorities and identify waters targeted for State TMDL initiation during the next two years. EPA will complete a proposed list including these elements, and take public comment on its proposed list.

Conditional approval. If EPA determines that a State list is predominantly acceptable, but disagrees with minor elements (e.g., pollutants or stressors causing an impairment), EPA may conditionally approve the list. Conditional approval should be used only for minor deficiencies in State submissions and should not be used to provide general review comments.

When a list has been conditionally approved, EPA will provide the rationale and any available supporting technical information used to justify the suggested revisions, deletions, or additions to the State list and allow the State a specified time period (typically 30 days unless a longer time period is necessary to allow public comment regarding the requested changes) to meet the conditions that EPA outlines. EPA will review the State response and determine whether the specified conditions are satisfied within 30 days of the State response.

Partial approval/partial disapproval. If EPA determines that parts of a State list are approvable and other parts of a State list must be disapproved, EPA may either disapprove the entire list or partially approve/partially disapprove it. In the event of a partial approval/partial disapproval, EPA must then revise the disapproved portion of the list and propose it for public comment as a supplement to the partially approved State list.

Whatever action EPA takes on a State list, EPA should explain the technical, programmatic, and administrative reasons for the action.

Question 1f(ii). *Can waterbodies be taken off the 303(d) list prior to TMDL development?*

Because section 303(d) lists are dynamic, they may change from one two-year listing cycle to the next. A State may choose to remove a waterbody from its section 303(d) list if that waterbody is meeting all applicable water quality standards (including numeric and narrative criteria and designated uses) or is expected to meet these standards in a reasonable timeframe as the result of implementation of required pollutant controls. It may also be appropriate to remove a waterbody from the section 303(d) list if, upon re-examination, the original basis for listing is determined to be inaccurate. Removal of waterbodies from section 303(d) lists can be done once every two years, or as the waterbodies attain water quality standards during the biennium.

2. INTEGRATE THE SECTION 303(d) LISTING PROCESS MORE COMPLETELY INTO OTHER STATE PROGRAM ACTIVITIES, ESPECIALLY AS IT RELATES TO THE WATERSHED PROTECTION APPROACH AND THE TARGETING OF HIGH PRIORITY WATERSHEDS

Question 2a. *How does the TMDL process fit in with other CWA water quality program activities?*

The TMDL process is linked to all current State water quality activities. The TMDL process is the technical backbone of the Watershed Protection Approach (WPA), a comprehensive, integrated strategy for more effectively restoring and protecting aquatic ecosystems and protecting human health in geographically targeted watersheds. The TMDL process allows water resource managers and scientists to determine, on a watershed scale, the pollutants or stressors causing impairments and the allocations necessary to meet applicable water quality standards. In addition, the TMDL process provides a mechanism for States to target and prioritize watersheds where action is needed. Further, if a State adopts a rotating basin planning approach to implement its water quality programs, then TMDLs become an integral component of the basin schedule.

The development of section 303(d) lists and the establishment of TMDLs are facilitated by the collection of accurate chemical, physical, and biological data. Therefore, the TMDL process is closely linked to State water quality monitoring programs. Most states currently use the waters listed in the section 305(b) reports as not fully supporting designated uses as a starting point for the section 303(d) lists.

TMDLs can provide a critical connection between water quality standards and water quality-based controls, including National Pollutant Discharge Elimination System (NPDES) permits in the standards to permits process, and BMPs to control nonpoint sources. TMDLs are established based on the goal of attaining water quality standards, including designated uses, numeric and narrative criteria, and antidegradation provisions. Where TMDLs are established, NPDES permits are based on the TMDL and associated wasteload allocations, and nonpoint source controls are implemented consistent with the TMDL and associated load allocations. As a result, permits scheduled for reissuance and State nonpoint source control programs under CWA section 319 provide important information for consideration when developing 303(d) lists and the subsequent TMDLs.

Question 2b. *What is the relationship between the TMDL process and the requirements of the Endangered Species Act (ESA)?*

Section 7 of the ESA provides broad, general guidance to Federal agencies on how to interact with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in consultations to determine whether a proposed federal action will affect endangered or threatened species or designated critical habitat. An "action" as defined by the ESA includes all activities or programs that are *authorized, funded, or carried out*, in whole or in part, by Federal agencies.

Whether or not TMDLs, or steps in the TMDL process, are actions as designated under the ESA is a question that is as yet unanswered. An interagency task force including EPA, USFWS, and NMFS is currently developing consultation guidance related to the Clean Water Act. The task force has suggested that the entire process from developing water quality standards to the issuance of a NPDES permit may potentially be viewed as one action. If this is the case, TMDLs may or may not require ESA consultation.

In general, the TMDL process should work to uphold the purpose and intent of the ESA. Consequently, in developing 303(d) lists, States should try to ascertain whether or not threatened or endangered species inhabit waterbodies, whether waterbodies have been designated as critical habitat, and whether proposed TMDLs are sufficient to meet water quality standards designed to protect threatened or endangered species. EPA will continue to monitor the interagency task force's progress in determining what portions of water quality programs may be subject to ESA consultation requirements.

3. ASSURE EVEN AND CONSISTENT APPLICATION OF NATIONAL SECTION 303(d) REQUIREMENTS, ESPECIALLY WITH REGARD TO PUBLIC INVOLVEMENT IN THE 303(d) LIST DEVELOPMENT PROCESS

Question 3a. *How can States and EPA assure consistent application of the national TMDL program?*

To assure consistency throughout the country in the TMDL process, States and EPA must follow EPA regulations and should follow national TMDL guidance, including the guidance outlined in this memorandum. Any questions about guidance should be directed to EPA. In addition, States and EPA should communicate with each other as frequently as possible about issues related to the TMDL process, including administrative, programmatic, and technical issues. Finally, States and EPA should strive to be creative in finding solutions to TMDL related issues and problems (e.g., trading).

Question 3b. *How can States and Regions assure consistency in 303(d) lists and prioritization and targeting for waters that flow through more than one State?*

EPA has encouraged States to develop and use their own methods to set priorities and target waterbodies for TMDL development. Waterbodies may therefore be proposed for inclusion on the section 303(d) list that flow through multiple States. Consequently, in some cases, inconsistent listings may be proposed. Regions should be aware of such potential inconsistencies and discuss with the States the possibility of coordinating priority setting and TMDL development efforts. Regions should, if necessary, address any inconsistencies that occur within their jurisdictions among States' section 303(d) lists. Regions are also expected to be aware of, account for, and if necessary, address any inconsistencies between a State of theirs and the State of an adjacent Region.

EPA believes that existing coordination mechanisms are adequate to deal with most potential inconsistencies, and that at this time, it is impractical and unnecessary to institute a formal "cross-checking" procedure to minimize Region-to-Region inconsistencies. However, informal Regional communications, especially between geographically adjacent and geographically similar Regions, should occur on a regular basis to help alleviate, or account for, inconsistencies. EPA Headquarters will help expedite such communication in several ways: (1) by scheduling and facilitating conferences calls among Regions, and (2) by examining the section 303(d) lists submissions to identify any gross inconsistencies.

Question 3c. *How does public participation fit into the TMDL process?*

There was some confusion in 1992 on requirements for States to provide for public participation in developing §303(d) lists and several Regions had to make section 303(d) list approval/disapproval decisions conditional on State fulfillment of public participation requirements. However, for the 1994 submittal and review process, EPA expects that all public participation requirements will be fulfilled prior to submitting the final section 303(d) list to EPA for formal review.

Public participation for section 303(d) lists must be consistent with section 101(e) of the CWA, which requires EPA and States to provide public participation "in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established...under the Act." EPA regulations require States to provide public participation in the development of lists of impaired waters under section 303(d). Public participation requirements are outlined in 40 CFR Part 25. In addition, Section 303(d)(2) (40 CFR 130.7(a)) provides that the process for developing section 303(d) lists and public participation be described in the State Continuing Planning Process under section 303(e).

Public participation is that part of the decision making process through which responsible officials become aware of public attitudes by providing ample opportunity for interested and affected parties to communicate their views. Public participation includes providing access to the decision making process, seeking input from and communicating with the public, assimilating public viewpoints, and preferences, and demonstrating that those viewpoints and preferences have been considered by the decision making official.

In the identification of water quality-limited waterbodies for State section 303(d) lists, States need to involve the public as part of their review of all existing and readily available data and information. EPA also expects States to include public participation in its determination of high priority targeted waterbodies that will proceed with TMDL development within two years following the listing process. At a minimum, public participation in the TMDL process should entail notifying the availability of proposed lists in a State Register or equivalent or a State-wide newspaper with a comment period of not less than 30 days. Public meetings should be held at the discretion of each State. It may be expedient to combine public notice for section 303(d) actions with public notices for other water program activities.

303(d) List Update, February, 1994

WATERBODY TARGETED	REASON	UPDATES: LISTS
Laguna de Santa Rosa.....	TMDL/Nutrients	02/02/94
Beaughton Creek.....	TMDL/Superfund	02/02/94
Stemple Creek.....	TMDL/Nutrients	02/02/94
Estero de San Antonio.....	TMDL/Nutrients	02/02/94
Americano Creek.....	TMDL/Nutrients	02/02/94
Estero Americano.....	TMDL/Nutrients	02/02/94

Seventeen additions in 1993:

Garcia River.....	sediment	02/02/94
Klamath River.....	temp, nutrients	02/02/94
Redwood Creek.....	sediment	02/02/94
Scott River.....	sediment	02/02/94
Shasta River.....	d.o., temp	02/02/94
Tomki Creek.....	sediment	02/02/94
Eel River.....	sediment, temp	02/02/94
Mad River.....	sed, turbidity	02/02/94
Navarro River.....	sediment	02/02/94
South Fork Trinity River..	sediment	02/02/94
Trinity River.....	sediment, temp	02/02/94
Albion River.....	sediment	02/02/94
Big River.....	sediment	02/02/94
Gualala River.....	sediment	02/02/94
Mattole River.....	sediment, temp	02/02/94
Noyo River.....	sediment	02/02/94
Van Duzen River.....	sediment	02/02/94

TMDL = total maximum daily load process for waste load reductions

Nutrients = nitrogen and phosphorus, primary plant nutrients that can cause increased algal growth

SED, Sediment = excessive sedimentation

d.o. = depressed dissolved oxygen levels

temp = elevated water temperature

turbidity = elevated turbidity

STAFF REPORT ON THE
1994
WATER QUALITY ASSESSMENT
FOR THE
NORTH COAST REGIONAL WATER QUALITY CONTROL BOARD

Prepared by
Bruce A. Gwynne
Environmental Specialist

California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd, Ste. A
Santa Rosa, CA 95403

February 24, 1994

INTRODUCTION

Section 305(b) of the Federal Clean Water Act (CWA) establishes a process for reporting about the quality of the nation's water resources to the U.S. Environmental Protection Agency (EPA) and Congress. Each State, Territory, and Interstate Commission develops a program to monitor the quality of its surface and ground waters and report the status of water quality every two years to the EPA on or before April 1 of every even year (an extension was granted to the State in 1994). This information is compiled into a biennial report to Congress. Additionally, various sections of the Clean Water Act require that the EPA maintain lists of water bodies regulated by those sections. Lists are required by Sections 303(d), 304(1), 314, and 319 of the CWA, as well as Section 40CFR Part 131.11. States are expected to submit these lists either as part of or at the same time as the biennial section 305(b) reports. Each of these lists is described below:

The 131.11 list is a list of surface waterbody segments which may be affected by toxic pollutants or segments with concentrations of toxic pollutants that warrant concern.

Section 303(d) requires States to identify waters that do not or are not able to meet applicable water quality standards with technology based controls.

Section 304(1) was a one-time requirement to list three types of impaired water bodies: 1) the 'mini' list of waters for which the State does not expect to achieve numeric water quality standards for priority pollutants after technology based controls have been met, due to point or nonpoint source pollution, 2) the 'short' list of waters that are not expected to meet applicable standards after technology based controls have been met, due entirely or substantially to discharge of toxic pollutants from point sources, and 3) the 'long' list of waters that are not meeting fishable and swimmable goals of the CWA whether due to toxicity or other impairments due to point or nonpoint sources.

Section 314 lists publicly owned lakes for which uses are known to be impaired by point and nonpoint sources and which are targeted under the Clean Lakes Program for restoration.

Section 319 requires listing "navigable waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this Act." These waterbodies are targeted for nonpoint source controls.

In order to comply with listing requirements of Sections 305(b), 131.11, 303(d), 304(1), 314, and 319 of the CWA, the State Water Resources Control Board (State Board) adopted the Water Quality Assessment (WQA) for California's surface, estuarine, and ground waters on February 1, 1989.

The WQA employs a rating of waters as good, intermediate, impaired, and unknown.

The nine Regional Water Quality Control Boards (Regional Boards) reviewed and adopted updated versions of the WQA for their respective regions. On December 11, 1991, the North Coast Regional Board adopted the WQA for the North Coast Region.

This staff report details each CWA list and proposed changes to those lists and the North Coast Region's WQA, and presents the proposed 1994 WQA for the North Coast Region.

WATERS CURRENTLY LISTED IN THE NORTH COAST REGION

Waters in the North Coast Region are included on lists for CWA sections 303(d), 319, and 131.11. There are no North Coast Region waters on the 314 list. The proposed 1994 Regional WQA (Attachment 1) reflects changes in the 303(d) and 304(1) lists. Following is a discussion of these listings.

304(1) LIST

304(1) required three separate lists: the 'mini', 'short', and 'long' lists, typically designated by "304", followed by (M), (S), or (L), respectively. The 304(S) list was a list of waters that were not expected to meet applicable standards after technology based controls have been met, due entirely or substantially to discharge of toxic pollutants from point sources. The 304(L) list was a list of waters not meeting the fishable and swimmable goals of the CWA. It contained 95 North Coast Region.

303(d) LIST (Attachment 2)

303(d) requires States to identify waters that do not or are not able to meet applicable water quality standards after technology based controls have been implemented. Waters impacted by thermal discharges are also to be identified. For waters which are appropriately listed under 303(d), the State shall establish priority ranking, based on severity of pollution and extent of uses to be made of such waters. In accordance with the ranking, we will determine what wasteload reductions of point and nonpoint sources need to occur to meet applicable standards for a give waterbody. There is no specific deadline for these actions specified in the CWA. There is a two year time line for addressing the issues affecting waters which are targeted for total maximum daily load (TMDL) source reduction efforts.

319 LIST

319 requires listing "navigable waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this Act." The Shasta River has been targeted through State and Federal programs for remediation of nonpoint source impairment. Other North Coast Region waterbodies on the 319 list are: Americano Creek, Beaughton Creek, Laguna de Santa Rosa, and Stemple Creek.

PROPOSED 1994 WQA

At this time, the Regional Boards are completing biennial reviews and updates to the WQA. Attachment 1 is a copy of the proposed 1994 Regional Water Quality Assessment for the North Coast Region. This document includes proposed changes to the 1991 version, described below.

1. Deletion of references to 304(1) lists;
2. Addition of references to 303(d) list;
3. Inclusion of new information from recent Regional Board monitoring and assessment reports.

WOA GuideTHE NORTH COAST REGION WATER QUALITY ASSESSMENT

The waterbodies in the North Coast Region are grouped into seven categories. Each category is presented separately on its own page (or pages) under one of the following headings:

Wetlands
 Rivers and Streams
 Ocean and Open Bays
 Lakes and Reservoirs
 Ground Water
 Estuaries
 Bays and Harbors

Descriptions of the information under each column are provided below:

Waterbody Name

The name of the water body.

Hydro Unit #

The hydrologic unit number from the hydrologic basin maps. This designates the location of the waterbody in a watershed.

Water Quality Condition

The four columns under this heading indicate the areal extent of the water body that falls within each of the four water quality conditions: Good, Intermediate, Impaired, Unknown. The units of measurement are as follows:

linear miles - Rivers and Streams
 Ocean and Open Bays (coastline)
 acres - Wetlands
 Lakes and Reservoirs
 Estuaries
 Bays and Harbors
 square miles - Ground Water

Total Size

The total size of the waterbody.

Units

The measurement units for areal extent and total size.

Fact Sheet

This column indicates whether a fact sheet has been prepared. Fact sheets are supporting documents for high priority waterbodies.

Problem Description

These descriptions are short summaries of the threats and/or problems in a specific water body.

Problem Source

This column identifies the problem as coming from a point source discharge, nonpoint source, or both.

Federal Lists

An "X" in the column below a specific federal list identifies the water body as being on that list or proposed for listing. The federal lists are explained in the body of the staff report and summarized below:

- 131.11 Segments which may be affected by toxic pollutants or which have concentrations of toxics that warrant concern.
- 303(d) Water quality limited segments where water quality objectives are not expected to be met with technology based controls.
- 304(M) 304(1) "Mini List" of waters not meeting water quality objectives due to toxics from either point or nonpoint sources.
- 304(S) 304(1) "Short List" of waters not meeting water quality objectives because of toxics from point source discharges.
- 304(L) 304(1) "Long List" of waters not meeting water quality objectives for a variety of reasons.
- 314 A list of lakes nominated for restoration.
- 319 Water bodies targeted for nonpoint source pollution control activities.

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of June 15, 1967, Consolidated Case Number 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit;

1/4

all in the year 1994

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California,

this 7 day of January, 19 94

Judy A. Shaw
Signature

This space is for the County Clerk's Filing Stamp

CONTROL BOARD

REGIONAL

JAN 10 1994

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Proof of Publication of

Notice of Public Hearing to Consider

Adoption of Amendments to the 1991

Water Quality Assessment/305(b) Report

for the North Coast Region

Public Notices

California Regional Water Quality Control Board
North Coast Region
5550 Skylans Blvd., Suite A
Santa Rosa, CA 95403
(707) 576-2220

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF AMENDMENTS TO THE WATER QUALITY ASSESSMENT/305(b) REPORT FOR THE NORTH COAST REGION THURSDAY, FEBRUARY 24, 1994

at 9:00 a.m.
Eureka City Council Chambers
531 K Street
Eureka, California
CONTACT PERSON: Bruce Gwynee; Telephone No. (707) 578-2681.

The California Regional Water Quality Control Board, North Coast Region, will hold a Public Hearing to consider approval of the update and review of the Regional Water Quality Assessment (Assessment) for surface waters, ground waters, and coastal waters in the North Coast Region, as required under Section 305(b) of the Federal Clean Water Act (Act.)

BACKGROUND
On December 11, 1991, the North Coast Regional Water Quality Control Board adopted a version of the Assessment. Section 305(b) requires that the Regional and State Water Boards update the Assessment every two years. North Coast Regional water Board staff will complete an update of the Assessment for waters in the North Coast Region and present it to the Regional Water Board for approval at the public hearing.

Water Quality Assessments approved by the regional water boards are one element of the

State Board's Clean Water Strategy. The objective of the Clean Water Strategy is to focus water quality control efforts on California's most significant and important water resources. The public hearing on this matter has been scheduled for Thursday, February 24, 1994, at the Eureka City Council Chambers, 531 K Street, Eureka, at 9:00 a.m. or as soon thereafter as possible, or as announced in our Board agenda to be mailed by February 10, 1994.

The Regional Water Board is soliciting comments on this update of the Assessment. Interested persons are encouraged to submit to the Regional Water Board office any written comments or recommendations so that a written response may be prepared for distribution and review at the February 24, 1994, public hearing.

Oral testimony may be limited at the public hearing in order to accommodate all speakers who wish to testify. The total time of testimony, or length of testimony allotted each speaker, may be limited based on the indicated number of speakers and available time. All interested persons will be given an opportunity to speak and respond to material being presented. However, the Regional Water Board will encourage speakers to avoid repetitive testimony and to briefly summarize written testimony. A copy of the proposed Regional Water Quality Assessment may be obtained from the Regional Water Board after January 28, 1994. All related documents are on file and may be reviewed at the Regional Water Board office during regularly scheduled file access times.

BENJAMIN D. KOR
Executive Officer
December 29, 1993

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt. State of California, under the date of June 15, 1967. Consolidated Case Number 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

August 30

all in the year 1995

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California,

this 31 day of August, 1995

Archie ...
Signature

CONFIDENTIAL
This space is for the County Clerk's Filing Stamp
RECEIVED
SEP 5 1995

- BK _____
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- ALL STAFF _____

Proof of Publication of

Notice of public hearing

California Water Quality Control Board North Coast Region 5550 Skylane Boulevard Suite A Santa Rosa, California 95403 (707)576-2220
NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF THE 1996 WATER QUALITY ASSESSMENT/ 305(b) REPORT/ 303(d) LIST FOR THE NORTH COAST REGION

The California Regional Water Quality Control Board, North Coast Region, will hold a public hearing to receive comments regarding the review and update of the Regional Water Quality Assessment (Assessment) for surface waters, ground waters, and coastal waters in the North Coast Region.

as required under Section 305(b) of the Federal Clean Water Act (Act). Included in the Assessment is the list of water quality limited waterbodies, required under Section 303(d) of the Act (303(d) list), which will also be reviewed. The public hearing will be held at 8:30 a.m., or as soon thereafter as practicable, as follows:

Thursday, October 26, 1995
Crescent City Board of Supervisors
Chambers
583 G Street
Crescent City, California 95531
Subsequently, the Regional Board will continue the public hearing to consider approval of the update and review of the Assessment. The extended public hearing will be held at 8:30 a.m., or as soon thereafter as practicable, as follows:

Thursday, December 7, 1995
Regional Water Quality Control Board
Hearing Room
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403
The Regional Board may extend the public hearing beyond December 7, 1995, if necessary.

BACKGROUND
On February 24, 1994, the North Coast Regional Water Quality Control Board adopted a version of the Assessment. Section 305(b) requires that the Regional and State Boards update the Assessment every two years. The Regional Board is soliciting comments for this up-

Water Quality Assessments approved by the Regional Boards are one element of the State Board's Clean Water Strategy. The objective of the Clean Water Strategy is to focus water quality control efforts on California's most significant and important water resources. Interested persons are encouraged to submit to the Regional Board office any written comments or recommendations so that a written response may be prepared for distribution and review at the October 26, 1995 public hearing.

Oral testimony may be limited at the public hearing in order to accommodate all speakers who wish to testify. The total time of testimony, or length of testimony allotted each speaker, may be limited based on the indicated number of speakers and available time. All interested persons will be given an opportunity to speak and respond to material being presented. However, the Regional Board will encourage speakers to avoid repetitive testimony and to briefly summarize written testimony.

The 1994 North Coast Regional Water Quality Assessment and 303(d) list are available from the Regional Board office. All related documents are on file and may be reviewed at the Regional Board office at 5550 Skylane Boulevard, Suite A, Santa Rosa, California, from 1:30 p.m. to 4:30 p.m. on Mondays; 8:30 a.m. to 11:30 a.m. and 1:30 p.m. to 4:30 p.m. on Tuesdays, Wednesdays and Thursdays; and from 8:30 a.m. to 11:30 a.m. on Fridays. Persons wishing to review said documents should telephone the Regional Board office at (707)576-2220 to schedule an appointment.

North Coast Regional Board staff will review public input and complete an update of the Assessment for waters in the North Coast Region. A staff report detailing the proposed update of the Assessment will be available for review on November 7, 1995. Interested persons may obtain a copy by contacting the Regional Board office. The proposed update will be presented to the Regional Board for approval at the extended public hearing on December 7, 1995.

CONTACT PERSON: Bruce Gwynne (707) 576-2661.
Benjamin D. Kor
Executive Officer
August 24, 1995

Law Offices of
JOSEPH J. BRECHER
1970 BROADWAY, 12TH FLOOR
OAKLAND, CALIFORNIA 94612

JOSEPH J. BRECHER
DAVID L. HENKIN

Planning: WQ
FILE: 303(d)
COPY: WQA TMDL
WATER QUALITY
CONTROL BOARD
REGION 1
JAN 5 '95
FAX: (510) 272-0433
(510) 272-0579

December 23, 1994

BY CERTIFIED MAIL

Ms. Carol M. Browner, Administrator
Environmental Protection Agency
401 "M" Street, S.W.
Washington, D. C. 20460

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Re: Notice of Intent to Commence a Civil Action Over EPA's Failure to Perform Nondiscretionary Duties Under Clean Water Act §303(d)

Dear Administrator Browner:

Pursuant to the 60-day notice requirement of Section 505(b)(2) of the Clean Water Act, 33 U.S.C. §1365(b)(2), the Sierra Club, Friends of the Garcia, Coast Action Group, California Trout, Pacific Coast Federation of Fishermen's Associations, and the Environmental Protection & Information Center hereby notify you of their intent to commence a civil action under Section 505(a)(2) of the Act, 33 U.S.C. §1365(a)(2). By this suit, these organizations will seek to compel the Administrator of the Environmental Protection Agency ("EPA") to fulfill the nondiscretionary duties imposed by Clean Water Act ("CWA" or the "Act") Section 303(d), 33 U.S.C. §1313(d). In particular, EPA must disapprove the failure by the State of California to establish Total Maximum Daily Loads ("TMDLs") for 17 North Coast rivers and streams facing serious ecological threats due to elevated temperatures and sediment levels caused, among other things, by logging and de-watering due to agricultural withdrawals. Because the State does not intend to establish TMDLs for these 17 segments in the foreseeable future, EPA must itself establish TMDLs in accordance with a priority ranking of those waterbodies.

I. LEGAL FRAMEWORK

Congress' stated intent in passing the Clean Water Act, 33 U.S.C. §1251, *et seq.*, was to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." *Id.* at §1251(a). In interpreting the Act, courts have held that "all issues must be viewed in light of that intent." *American Petroleum Institute v. EPA*, 540 F.2d 1023, 1028 (10th Cir. 1976). The Act further sets the national goals of eliminating "discharge of [all] pollutants into navigable waters," 33 U.S.C. §1251(a)(1), and, in the interim, of attaining "water quality which provides

for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" by July 1, 1983. *Id.* at §1251(a)(2).

To help accomplish these tasks, states must identify water segments within their boundaries which do not or may not comply with applicable water quality standards ("WQS") despite the imposition of point source effluent limitations. *Id.* at §1313(d)(1)(A). Each state must then establish a priority ranking for these "Water Quality Limited Segments" ("WQLSs"), 40 C.F.R. §130.2(i), for which a separate TMDL for a list of specified pollutants must be established. *Id.* at §130.7(b)(1)(iii).

TMDLs "implement the applicable [narrative and numerical] WQSs with seasonal variation and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." 33 U.S.C. §1313(d)(1)(C). Since each TMDL must address both the point and nonpoint sources of a pollutant, each consists of the sum of a "Wasteload Allocation" ("WLA") -- the portion of a segment's loading capacity¹ attributable to existing or future point source pollution (40 C.F.R. §130.2(g)) -- and a "Load Allocation" ("LA") -- the portion attributable to nonpoint sources (*Id.* at §130.2(f)). As with TMDLs, all WLAs and LAs must be set to sustain applicable WQSs with an adequate safety margin, allowances for seasonable variations and critical conditions for stream flows, loading, and water quality parameters. *Id.* at §130.7(c)(1).

CWA §303(d)(2) requires a state, "from time to time, with the first such submission not later than one hundred and eighty days after the date of publication of the first identification of pollutants [for which TMDLs will be required]," to submit for EPA's review a list of its WQLSs requiring TMDLs and a list of TMDLs for those segments. 33 U.S.C. §1313(d)(2). Once submitted, EPA has thirty days in which to "approve or disapprove" the proposed listings and loadings. 40 C.F.R. §130.7(d)(1). If approved, the TMDLs will be incorporated into the state's Water Quality Management Plan ("WQMP"). If they are rejected, however, EPA has thirty days to develop its own WQLS list and its own TMDL, WLA and LA designations for the state to incorporate into its WQMP. *Id.*

II. EPA AND THE STATE OF CALIFORNIA HAVE SHIRKED THEIR DUTIES UNDER SECTION 303(d) OF THE ACT

On September 24, 1992, EPA partially approved a WQLS list submitted by the State of California, at the same time requesting additional information concerning a large number of

¹ "Loading capacity" is defined as "the greatest amount of loading [(matter or thermal energy that is introduced into a receiving water)] that a water can receive without violating water quality standards." 40 C.F.R. §130.2(e), (f).

Carol M. Browner, Administrator

Page 3

January 3, 1995

potential candidate waters and offering the State an opportunity to expand its list to include those waters. On October 28, 1992, the State refused to expand its WQLS list. Therefore, on October 19, 1993, EPA Region IX formally disapproved the State's decision not to list additional WQLSs. At the same time, it named the following 17 additional waterbodies as WQLSs:

<u>Waterbody Name</u>	<u>Pollutant(s)</u>
Garcia River	Sediment
Trinity River	Sediment, temperature
Gualala River	Sediment
Redwood Creek	Sediment
Shasta River	Dissolved oxygen
Scott River	Sediment
Klamath River	Temperature, nutrients
Tomki Creek	Sediment
Big River	Sediment
Albion River	Sediment
Van Duzen River	Sediment
S. Fork Trinity River	Sediment
Eel River	Sediment, temperature
Mad River	Sediment, turbidity
Mattole River	Sediment, temperature
Navarro River	Sediment
Noyo River	Sediment

Note: Although the Garcia River was listed by EPA only for sediment impairment, our data shows conclusively that elevated temperature also has a significant adverse impact on the fishery.

EPA's October 19, 1993, action reaffirmed its approval of California's list of highest priority waters targeted for TMDL development and stated specifically that the inclusion of the 17 additional rivers listed above did not affect the approval of that priority list.

More than a year has passed since the addition of the 17 North Coast rivers to the 303(d) list, but neither the State nor EPA has taken any action to begin work on setting TMDLs for those waters. Indeed, at a workshop presented by EPA Region IX on November 8-10, 1994, officials from both the State Water Resources Control Board and EPA indicated that they had

Carol M. Browner, Administrator

Page 4

January 3, 1995

no plans to begin such efforts at any time in the foreseeable future, allegedly because they do not have the resources to do so. Since the State originally refused to add the 17 waters to the 303(d) list, it seems safe to assume that it never intends to take any such action. Accordingly, EPA is now required to disapprove California's action and to itself establish appropriate TMDLs for the State's Section 303(d) waters. See *Alaska Center for the Environment v. Reilly*, 762 F.Supp. 1422 (WD Wash. 1991) ("*ACE I*"); *Alaska Center for the Environment v. Reilly*, 796 F.Supp. 1374 (WD Wash. 1992) ("*ACE II*"); *Scott v. City of Hammond*, 741 F.2d 992 (7th Cir. 1984). As the court noted in *ACE I*, "Section 303(d) expressly requires the EPA to step into the states' shoes if their TMDL submissions or lists of water quality limited segments are inadequate." 762 F.Supp. at 1429. "[T]he 'inadequacy' of a submission includes deliberate, silent inaction." *Ibid*.

Under 33 U.S.C. §303(d)(2) and 40 C.F.R. §130.7(d), after disapproval of California's §303(d) submissions, EPA has thirty days to establish TMDLs. Since the State has clearly indicated that it will take no action to establish TMDLs for the 17 North Coast rivers, EPA has a non-discretionary duty to do so. We therefore urge your agency to begin the process immediately of prioritizing those rivers and establishing a schedule whereby TMDLs will be speedily enacted for all of them. We sincerely hope the EPA will act voluntarily to perform its duty; if it refuses to do so, we will have no alternative but to begin appropriate litigation.

Yours truly,

JOSEPH J. BRECHER

JJB:clg

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of June 15, 1967 Consolidated Case Number 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type no smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

11/2

All in the year 19 97

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California, this 4 day of November 1997
Annexed Clism
Signature

this space is for the County Clerk's Filing Stamp

WATER QUALITY CONTROL BOARD REGION 1

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Proof of Publication of

Notice Of Public Hearing

California Water Quality Control Board
North Coast Region
5550 Skyline Boulevard, Suite A
Santa Rosa, California, 95403
(707)578-2220

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF THE 1998 WATER QUALITY ASSESSMENT/ 305(b) REPORT/ 303(d) LIST FOR THE NORTH COAST REGION

The California Regional Water Quality Control Board, North Coast Region will hold a public hearing to consider staff recommendations regarding the update of the Regional Water Quality Assessment (Assessment) for surface waters, ground waters, and coastal waters in the North Coast Region, as required under Section 305(b) of the Federal Clean Water Act(Act). Included in the Assessment is the list of water quality limited waterbodies, required under Section 303(d) of the Act (303(d)list), which will also be reviewed. The public hearing will be held at 8:30 am., or as soon thereafter as practicable, as follows:

Thursday, December 11, 1997
Ukiah City Council Chambers
300 Seminary Avenue
Ukiah, CA

The Regional Water Board may extend the public hearing beyond December 11, 1997 if necessary.

BACKGROUND
Section 305(b) requires that the Regional and State Water Boards update the Assessment every two years. The North Coast Regional Water Quality Control Board last adopted a 1996 Regional Water Quality Assessment, 303(d) List and Prioritization Update on December 7, 1995.

The Regional Water Board has solicited comments to update the Assessment. Interested persons were encouraged to submit to the Regional Water Board office any written comments or recommendations for distribution and review prior to the December 11, 1997 public hearing. Oral testimony was also encouraged and recorded at Public Hearings on September 25, 1997 and October 23, 1997. North Coast Regional Water Board staff will review public input and complete an update of the Assessment for waters in the North Coast Region. The proposed update will be available for 30 day public review on November 10, 1997, and will be presented to the Regional Water Board for consideration at the public hearing on December 11, 1997.

Copies of the 1998 North Coast Regional Water Quality Assessment and 303(d) list are available at the Regional Water Board office. All related documents are on file and may be reviewed at the Regional Water Board office during regularly scheduled file access times. The staff report detailing recommendations for the update of the 303(d) List of Waters Requiring establishment of Total Maximum Daily Loads will be available for review after November 10, 1997, at the Regional Water Board office.

FILE: PLANNING
WATER QUALITY
WQA/303(b)NCRWQCB
Santa Rosa

October 22, 1997

Re Inclusion of the Ten Mile River in Mendocino County unto the Board's 303(d) list

Board Members.

Since the Friends of The Ten Mile (FOTTM) appeared before you two years ago requesting that this Board correct the administrative error deleting the Ten Mile River from the original 303(d) list, the EPA has done so. The EPA has further scheduled the establishment of Ten Mile's TMDLs for the year 2000.

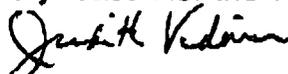
We are asking you to complete your ministerial duty by making sure The Ten Mile appears on your own list of water-quality waterbodies to accurately reflect the EPA list.

Recently both the California Department of Fish and Game and Water Quality staff have filed a non-concurrence on a Georgia-Pacific timber harvest plan, THP 1-97-348. The National Marine Fisheries Service says this about those recent non-concurrences

Based on our review...I agree that the approval of these plans may adversely impact coho salmon and steelhead within [this] watershed. Over the last year, in discussions with [CDF] and industry, we have repeatedly been told that the California Forest Practice Rules and the THP review process are fully adequate to protect salmonids. The letters of non-concurrence do not support this position... [T]he proposed mitigations [by WQ & DF&G] were justified given the concerns with roads and sediment transport, lack of large wood recruitment, water temperature, and the establishment of adequately sized WLPZs & ELZs...NMFS believes that the scientific literature indicates that the habitat requirements of coho salmon and steelhead in most watersheds is not being met through the application of the FPRs.

The single plan with the non-concurrence is not the only THP that is not providing for protection and recovery of the coho and steelhead. DF&G and WQ both tried to put similar mitigations into THP 1-97-206 and were rejected by the review team chair. Given that WQ only goes out on about 15% of PHIs we can see that 85% of plans do not receive the level of review required to protect beneficial uses of water.

Let me point out that this situation antedates the listing of the coho salmon--in fact has led to its listing. Until this situation is corrected and TMDLs are established and adhered to, there is every reason for the Ten Mile to remain on the 303(d) list.



Judith Vidaver, Chair Friends of the Ten Mile



United States Department of the Interior

FISH AND WILDLIFE SERVICE
COASTAL CALIFORNIA FISH AND WILDLIFE OFFICE
1125 16TH STREET, ROOM 209
ARCATA, CA 95521
(707) 822-7201
FAX (707) 822-8411

WATER QUALITY
CONTROL BOARD
REGION 1

SEP 26 '97

September 23, 1997

Mr. Bruce Gwynne
Environmental Specialist
California Regional Water Quality Control Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

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- FILE

Mr. Gwynne,

In 1986 the United States Environmental Protection Agency (EPA) published "Quality Criteria for Water 1986" which established criteria recommendations for many water quality parameters and pollutants. Phase I (water quality) of the Klamath River basin flow-related scoping study will be performed using the EPA, 1986 water quality criteria that specifically apply to the most sensitive anadromous fish species (i.e. salmonids) (Campbell 1995). These water quality criteria are presented in Table 1. Each state also has water quality criteria and/or standards developed for waters within their domains. The California North Coast Regional Water Quality Control Board's (CNCRWQCB) current development of Total Maximum Daily Load (TMDL) allocations for 18 water bodies on the North Coast of California represents this type of effort (Campbell 1995). Included in the CNCRWQCB's TMDL development for these 18 water bodies are four contiguous sections of the mainstem Klamath River in California (Table 2). In comparison, the EPA's 1986 criteria for salmonids appear more comprehensive than the CNCRWQCB's proposed TMDL allocations for the mainstem Klamath River. However, the CNCRWQCB uses the term "nutrients" which may include many of the specific parameters (e.g. ammonia, orthophosphorus, and heavy metals) given in the EPA 1986 criteria. Water temperature and nutrient levels are certainly applicable water quality criteria for the Klamath River. However, the U.S. Fish and Wildlife Service (Service) is very concerned that the CNCRWQCB's proposed TMDL allocations do not include dissolved oxygen (DO₂) concentrations as a standard measurement of water quality.

Service concerns are based on several factors including the current status of coho and steelhead populations on the Klamath River, past and current land use practices in the Klamath basin and their effects on water quality, annual fish and temperature monitoring data, documented fish kills, and current water quality monitoring data which indicate that acute and chronic values for temperature and DO₂, as specified by the EPA 1986 criteria for salmonids, are observed in the mainstem Klamath River particularly during some summer periods.

Table 1. U.S. Environmental Protection Agency, 1986 Criteria for Selected Water Quality Parameters in the Klamath basin, Oregon (USEPA 1986).

Parameter	Acute Value	Chronic Value	Other Value
Temperature	20°C (1 day)	15°C (7 days)	
Dissolved Oxygen	5 mg/l	7 mg/l	
pH			<6.5 & >9.0
Alkalinity (CaCO ₃)	Weakly buffered		0 - 75 mg/l
Total Ammonia	0.91 mg/l @ pH 9 6.30 mg/l @ pH 8 23.00 mg/l @ pH 7	0.13 mg/l @ pH 9 1.00 mg/l @ pH 8 1.49 mg/l @ pH 7	
Orthophosphorus	1 mg/l	50 ug/l	
Cadmium	1.80 ug/l 3.90 ug/l 8.60 ug/l	0.66 ug/l 1.10 ug/l 2.00 ug/l	@ 50 mg/l CaCO ₃ @100 mg/l CaCO ₃ @200 mg/l CaCO ₃
Copper	9.20 ug/l 18.00 ug/l 34.00 ug/l	6.50 ug/l 12.00 ug/l 21.00 ug/l	@ 50 mg/l CaCO ₃ @100 mg/l CaCO ₃ @200 mg/l CaCO ₃
Iron			1 mg/l
Lead	34.00 ug/l 82.00 ug/l 200.00 ug/l	1.30 ug/l 3.20 ug/l 7.70 ug/l	@ 50 mg/l CaCO ₃ @100 mg/l CaCO ₃ @200 mg/l CaCO ₃
Manganese			50 ug/l
Mercury	2.40 ug/l	0.12 ug/l	
Selenium	250.00 ug/l	35.00 ug/l	
Zinc	180.00 ug/l 320.00 ug/l 570.00 ug/l	47.00 ug/l 47.00 ug/l 47.00 ug/l	@ 50 mg/l CaCO ₃ @100 mg/l CaCO ₃ @200 mg/l CaCO ₃

On May 6, 1997, the National Marine Fisheries Service (NMFS) listed coho salmon of the Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU) (encompassing populations of the Klamath River basin) as a threatened species under the Endangered Species act (ESA) of 1973 (62 Federal Register (FR) No. 87, 24588-24609). On August 11, 1997, the NMFS, while acknowledging that "these fish are in serious trouble", deferred for six months a listing decision on steelhead stocks of the Klamath Mountains Province ESU. A common life history strategy of both coho salmon and steelhead, which is not shared by the majority of Klamath basin juvenile chinook salmon, is that emigration (downstream migration to the ocean) does not occur until fish are at least one year of age. This extended freshwater

Table 2. U.S. Environmental Protection Agency/North Coast Regional Water Quality Control Board schedule for the development of Total Maximum Daily Load allocations covered by the Consent Decree¹.

Waterbody	Listed Pollutants	TMDL Completion Date	Lead Agency
Klamath River (Oregon Border to Iron Gate Dam)	Nutrients Temperature	12/31/2004	CNCRWQCB
Klamath River (Iron Gate Dam to Scott River)	Nutrients Temperature	12/31/2004	CNCRWQCB
Klamath River (Scott River to Trinity River)	Nutrients Temperature	12/31/2004	CNCRWQCB
Klamath River (Trinity River to the Ocean)	Nutrients Temperature	12/31/2004	CNCRWQCB

¹The schedule reflects the commitments made by U.S. EPA in settlement of a lawsuit (Pacific Coast Federation of Fishermen's Ass'n's v. Marcus) and the requirements of the Consent Decree in that action to address TMDL development on 18 water bodies on the North Coast of California. In addition, the schedule is based on the North Coast regional water Quality Control Board's approved TMDL schedule of 1995. This schedule does not reflect the complete adopted 303(d) list for the North Coast region. For those rivers not part of the consent decree the TMDL completion schedule remains the same as was approved by the North Coast Regional Board in 1995.

rearing period necessitates that water quality be adequate enough to support life through the summer period.

Land use over the past 135 years has changed in the Klamath basin. Mining and logging were the first two major land use changes that affected streams and rivers throughout the Klamath basin (Klamath River Basin Fisheries Task Force 1991). Irrigated agriculture and livestock grazing followed but the major development of irrigation and hydropower in the Klamath basin occurred over 50 years ago. Indirect effects, such as nutrient loading, cause changes in the physical environment that, in turn, can adversely affect salmonid life stages. On the mainstem Klamath River, the most obvious result is the luxuriant growth of aquatic plants and algae in the river channel. The growth of aquatic plants and algae fosters sediment accumulation that decreases spawning and rearing habitat. The growth and respiration cycles of aquatic plants affect DO₂ concentrations, especially during the summer months. The relationship between solubility of oxygen in water and temperature is inversely proportional and is applicable to the water quality issue here because increasing temperature and lower DO₂ concentrations typically occur during the summer months. These naturally occurring events interact synergistically and can have much greater impact than either temperature or DO₂ concentrations alone (Campbell 1995).

Since 1988, the Service's Coastal California Fish and Wildlife Office (CCFWO) has annually monitored the springtime emigrations of juvenile salmonids (chinook, steelhead, and coho salmon) on the Klamath and Trinity rivers. The sampling locations (Figure 1), near the terminus of each basin proper (above the

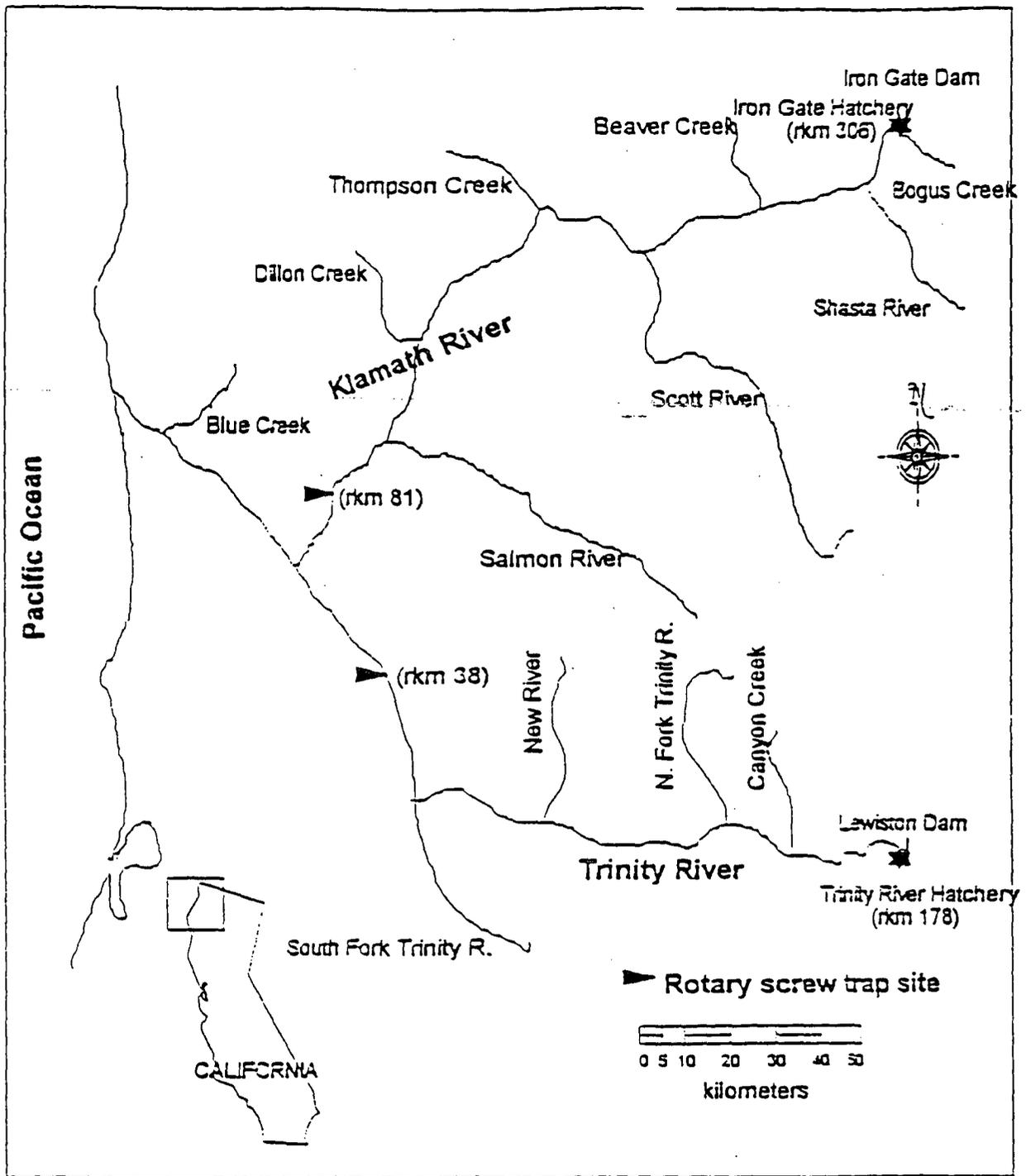


Figure 1. USFWS juvenile salmonid monitoring locations on the Klamath and Trinity rivers, 1989-1997.

Klamath-Trinity confluence), allow for assessment of a majority of each basin's respective fish production. Information collected include estimates of annual abundance, natural (or wild) and hatchery composition, peak emigration timing, size, health, and age class of emigrating salmonids. Other species captured (sturgeon, lamprey, suckers, sculpin, dace, shad, etc.,) are enumerated and measured to length. Fish health is assessed with the cooperation of the Service's California-Nevada Fish Health Center (CNFHC) and Humboldt State University. River flow information is provided by the U.S. Geological Survey gauging stations and hourly water temperature data is recorded at the trap sites using Ryan Tempmentor units.

The concurrent monitoring of fish populations, river flow, and water temperature on the Klamath and Trinity rivers has been a crucial asset of the juvenile salmonid monitoring program. The concurrent monitoring allows us to compare and contrast fish population abundances, migration timing, species compositions, and fish health between the two river systems. We also evaluate basin specific factors such as escapement, hatchery operations, river flow, and water temperature as possible influencing factors. As might be expected, there are similarities and differences observed each year with respect to fish populations of the two river systems and the factors possibly influencing them.

Of great concern to this office and of relevance to the intent of this letter, has been the consistently poorer health condition and higher mortality rates of fish captured on the Klamath River compared to fish captured at the Trinity River. Since monitoring with rotary traps began in 1989, field crews have consistently noted that during the late spring and summer period, captured Klamath River fish appeared less vigorous and had greater rates or intensities of various external parasites, fungus, lesions, or other externally apparent afflictions than did fish captured at the Trinity river trap. In addition to the observations of relatively poor health, there has been a consistently higher mortality rate of fish captured at the Klamath River trap than captured at the Trinity River trap. The catch and mortality data presented in Table 3 below are specific to juvenile chinook salmon as this is the most abundant species

Table 3. Total juvenile chinook captured during the months of May, June and July with associated mortality and percent mortality, at the Klamath and Trinity river rotary traps from 1992 to 1996.

Year	Klamath River Trap			Trinity River Trap		
	Total Chinook	Chinook Mortality	Percent Mortality	Total Chinook	Chinook Mortality	Percent Mortality
1992	5097	102	2.00	43960	176	0.40
1993	8933	72	0.81	5086	36	0.71
1994	55659	1745	3.14	56106	194	0.33
1995	13486	1325	9.83	2353	93	3.95
1996	25973	2004	7.72	13156	153	1.24
Total	109148	5248	4.81	120661	652	0.54

captured. The count of mortality include those fish that expired while entrained and those that were moribund before capture (floated into the trap). Although data presented in Table 3 are specific to juvenile chinook, the differentially higher rates of mortality between the two capture sites are consistent with nearly all fish species typically captured. The higher mortality rate of captured fish at the Klamath River trap is even more alarming considering that the holding time within the traps live box is much less than at the Trinity River trap. Since 1994, during summer (June-August) months, the Klamath River trap has been checked two to four times a day (within a 24 hour period). Prior to 1994 at the Klamath River trap and for all sample years at the Trinity River trap, sampling of the trap catch occurred just once in a 24 hour period. It was believed that by decreasing holding time we would reduce the stress levels of the entrained fish and thus lower the mortality rate. It is difficult to say how much higher the mortality rate of captured fish at the Klamath River trap would have been without these additional efforts.

In an attempt to determine the causative factors involved with the higher differential mortality rates and apparent poorer health of Klamath River trap captured fish we examined several possible factors. Mortality of trap captured fish may result from many stress-related causes such as the capture itself, and high debris loads and/or high fish densities within the trap's livebox (reduced water quality). However, these factors are similar for both traps throughout most of the trapping season and yet mortality rates are always higher for the Klamath River captured fish. The likely causative factor is a reduced health condition of fish on the Klamath River prior to capture at the trap. Health and physiology monitoring of chinook and steelhead smolts in the Trinity and Klamath rivers by the CNFHC has found that Klamath/Trinity basin salmonids are typically exposed to or infected with several disease pathogens during their juvenile life stage. Healthy fish are better able to cope with these infections or avoid infection entirely. However, stressful environmental conditions (e.g., poor water quality, crowding in raceways, release from hatchery into the river, etc.,) must usually occur before high intensity of infections are observed (USFWS 1994). Compromised health condition due to disease infection and/or other stress factors (e.g., smolting, high water temperatures) undoubtedly increases the probability of mortality prior to and/or following capture.

We first evaluated water temperatures as a probable contributing factor to the higher mortality rates of Klamath River fish. However, it was fairly apparent that the annual seasonal temperature profiles of the two rivers, as measured at the respective monitoring locations, were very similar (Figure 2). During summer months the mean daily water temperatures at both river locations typically exceeds the EPA's seven-day Chronic Value of 15°C. The apparent disparity (e.g., high mortality on the Klamath River and not on the Trinity River despite similar water temperatures) indicated that water temperature alone was not going to explain the differentially higher mortality rates of Klamath River fish.

Fish mortalities have not been limited to the juvenile salmonid monitoring operations. Significant fish kills have occurred on the Klamath River in the past few years as well. In late June of 1994, Service biologist began observing large numbers of dead and dying juvenile chinook in the Klamath River. Observations were made over a 30 mile section of the river between Presido Bar (river mile (rm) 81) and Bluff Creek (rm 49). Surveys were not conducted upstream of Presido Bar. At this same time, Service biologists and technicians from the Yurok Tribe reported seeing from a few to several hundred dead juvenile chinook on some gravel bars. These observations were made over a 35 mile section of the lower Klamath River from Cappell Creek to the Klamath River estuary.

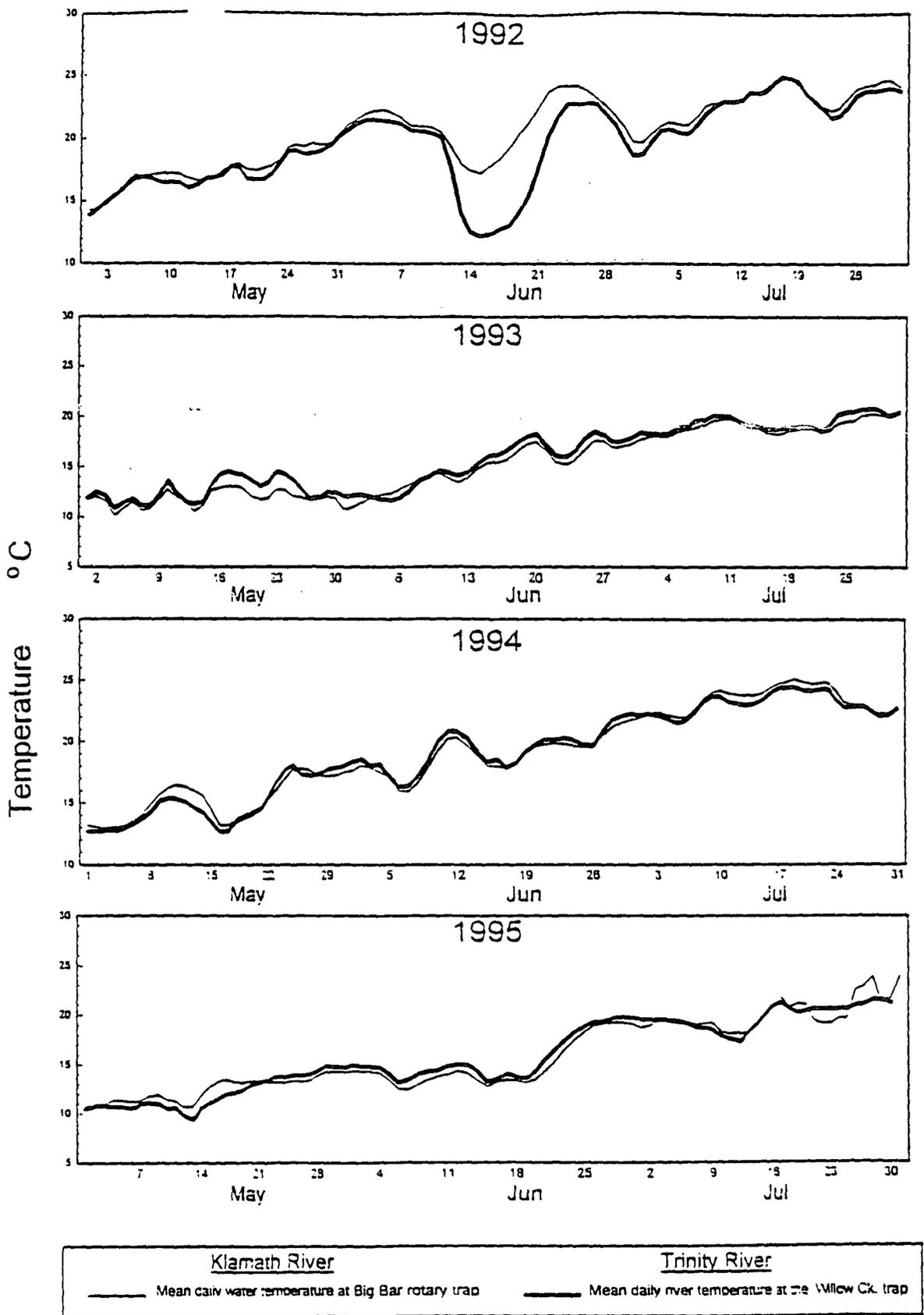


Figure 2. Mean daily water temperature during the months of May through July on the Klamath River (trap site = river mile 81) and Trinity River (trap site = river mile 38), for the years 1992-1995.

These same crews also received several reports from tribal fishermen regarding additional mortalities upstream of Cappell Creek. All species were effected to some degree. Observations of dead fish included small numbers of juvenile steelhead and other non-salmonid species. Observations and reports of dead fish continued for several weeks and then abruptly ended. Temperature data collected at the Big Bar trap site on the Klamath River indicated water temperatures peaked (mean daily = 25.1°C) on July 19 and decreased thereafter. Despite a similar temperature profile (mean daily water temperature recorded at the trap site on the Trinity River peaked at 24.4°C (from July 17-19)), no observations of dead or dying fish were made on the Trinity River during this period.

The most recent fish kill occurred on the Klamath River in early August 1997. Our first indications of a problem were the unusually large numbers (up to 50+/day) of dead adult Klamath smallscale suckers captured each day at the trap. Typically, live adult suckers are captured in very low numbers (few each month). Other dead and dying suckers were also observed in the river and along the shoreline. Speckled dace and sculpins (juveniles and adults) were also being captured in usually high numbers and with a high rate of mortality.

Concurrently, Service biologist conducting habitat typing work on the Klamath River reported seeing very high numbers of dead suckers and dace throughout a 75 mile section of the Klamath River from Thompson Creek (rm 123) to Aikens Creek (rm 48). Some mortality of juvenile chinook and steelhead was also observed. Personnel from the California Department of Fish and Game (CDFG) surveyed river areas from Iron Gate Dam (rm 190) downstream to Indian Creek (rm 107) for fish mortalities. Dead fish were only observed in the downstream-most area of the survey (M.Rode, CDFG, personal communication). Mel Willis, CDFG fish pathologist, examined several dead suckers and indicated that the fish may have been suffering from the bacteria *Columnaris*. The low level of chinook mortality observed in the river and trap, relative to the high chinook mortality observed in 1994, may be attributed to the fact that most chinook had already migrated through this area of river. Trap catches of juvenile chinook in 1997 peaked the week of June 29-July 5, and over 90% of the season catch had been made by July 19. In addition, it appears that some fish (primarily salmonids) were able to locate cool water "refugia" areas in the river. The Service's habitat typing crews observed hundreds of juvenile steelhead and chinook holding in cool water confluence pools below some tributaries. And, despite the fact that mean daily water temperatures at both trap locations (Table 4) exceeded EPA's one-day Acute Value of 20°C throughout July and August, there were no reports or direct observations of dead fish on the Trinity River.

Service biologist collected moribund adult suckers and sculpins for assessment by Dr. Gary Hendrickson at Humboldt State University (report attached as Appendix A). Dr. Hendrickson found high levels of parasites (*Lernaea* sp.) and bacteria (*Flexibacter columnaris* and *Aeromonas hydrophila*) in the suckers and "nearly double the heaviest infection I have ever seen before" of eye flukes (*Diplostomulum* sp.) in the sculpins. Dr. Hendrickson reported that *A. hydrophila* bacteria is often present in surface waters with a high organic load and affects fish only when fish are somehow compromised. In summary, Dr. Hendrickson speculated that "fish in the Klamath River are being stressed, probably by poor water quality. The most likely problems are high temperatures, low flows, low DO₂, and high ammonia". Piper et al (1992) associated *Columnaris* disease with environmental stress conditions such as high water temperature, low oxygen concentration, crowding, and handling (Piper et al 1992).

Table 4. Absolute minimum and maximum water temperatures, and average minimum, mean, and maximum daily water temperature by month for July and August 1997 at the Trinity and Klamath rivers.

Month	Temperature Criteria	Temperatures (°C) Klamath River	Temperatures (°C) Trinity River
July	Average Daily Minimum	21.3	19.6
	Average Daily Mean	22.0	21.4
	Average Daily Maximum	23.2	23.2
	Absolute Daily Minimum	17.7	16.0
	Absolute Daily Maximum	25.4	24.8
	Date of Absolute Maximum	July 28	July 28
August	Average Daily Minimum	21.9	20.4
	Average Daily Mean	22.6	21.8
	Average Daily Maximum	23.6	23.1
	Absolute Daily Minimum	21.2	18.6
	Absolute Daily Maximum	26.5	25.4
	Date of Absolute Maximum	August 8	August 8

To test if problems other than water temperature were contributing to the fish mortality we initiated short-term monitoring of other water quality parameters. On August 9-10 we monitored water temperature and DO₂ concentrations and on August 18-19, we monitored water temperature, DO₂, pH, and nutrient levels. Water samples were taken approximately 2 meters (m) out from shore at two depths (0.2 and 1.4m below surface). Samples were taken every few hours over a 24 hour period at the Big Bar river access on the Klamath River and analyzed using Hach testing procedures and equipment. Results from the August 9-10 sampling indicated DO₂ concentrations were below the EPA's Chronic Value (7.0 mg/l) throughout most of the 24 hour period and were at or below EPA's Acute Value (5.0 milligrams/liter (mg/l)) from approximately midnight to 8:00am (Table 5).

Dissolved oxygen levels of 5 mg/l or less are generally considered to be lethal or immediately threatening to the survival of most fish species (Campbell 1995, Gwynne 1993). With a water temperature of 20°C, the minimum DO₂ concentrations recommended to protect the health and physiological condition of cold- and warmwater fishes during rearing is 7.8 mg/l. At 25°C, the minimum required is 7.4mg/l (Wedemeyer et al. 1976).

By the third week of August, the number of dead fish captured at the Klamath River trap began decreasing. The trap ceased operation on August 20. The results of the water quality sampling conducted on August 18-19 indicated relatively improved temperature and DO₂ conditions (Table 6). The Service's

Table 5. Water temperature and dissolved oxygen concentration data collected over a 24 hour period from August 9-10, 1997, at the Big Bar river access, Klamath River.

Date	Time of Sample	Dissolved Oxygen (mg/l)		Water Temp. (°C)
		Shallow	Middle	
August 9	1200	7.8	7.4	25.0
	1600	6.2	6.0	26.5
	2000	5.6	5.5	24.3
August 10	2400	4.0	4.0	23.1
	0300	3.1	3.1	22.0
	0500	3.8	3.8	23.5
	0600	4.0	4.0	23.2
	0700	5.0	5.0	23.5
	0800	5.4	5.4	23.4
	0900	6.0	6.0	23.0
	1000	7.1	7.0	24.0
	1200	7.6	7.4	25.2

Sample depth: Surface = 0.18 meter, Middle = 1.37 meter

Table 6. Water quality data collected over a 24 hour period August 18-19, 1997, at the Big Bar river access, Klamath River.

Date	Time of Sample	Dissolved Oxygen mg/l		Water Temp. (°C)	pH	TDS (g/l)	NO3 (mg/l)	Specific Conduct. (ms/cm)
		Shallow	Middle					
8/18	1300	9.4	9.4	22.3	8.6	0.10	1.4	0.20
	1600	8.6	8.6	23.6	8.6	0.10	1.4	0.20
	2000	6.6	6.6	21.3	8.5	0.09	1.5	0.20
8/19	2400	5.3	5.3	20.7	8.4	0.08	1.6	0.19
	0300	5.0	5.0	20.1	8.5	0.08	1.8	0.19
	0500	5.4	5.5	20.3	8.5	0.08	1.7	0.18
	0600	6.0	6.0	20.8	8.4	0.08	1.6	0.18
	0700	6.4	6.4	21.1	8.4	0.09	1.7	0.18
	0800	7.0	7.0	21.4	8.3	0.09	1.8	0.18
	0900	7.3	7.3	21.7	8.2	0.08	1.8	0.17
	1000	7.4	7.4	22.1	8.5	0.09	1.9	0.17
	1200	8.9	8.9	22.1	8.5	0.09	1.6	0.18

Sample depth: Surface = 0.18 meter, Middle = 1.37 meter. NH4 (mg/l) samples negligible

habitat typing crews also resumed their field activities the week of August 18-22. The crews surveyed the Klamath River from Clear Creek (rm 99) downstream to Ikes falls (rm 64) and reported observing very few dead fish and relatively low fish densities at refugia areas.

During both water quality sampling periods in August, DO₂ concentrations showed strong diel fluctuations with minimum values observed in the dark early morning hours (midnight to 6:00am). Maximum DO₂ values were observed in the early afternoon hours (10:00am to about 6:00pm). Similar diel fluctuations of DO₂ concentrations have been observed in the Klamath basin on the Shasta River (Gwynne 1993). High DO₂ levels on the Shasta River were attributed to high photosynthetic production of plant matter during the day. Conversely, strong drops in DO₂ concentrations during nighttime hours are likely the result of high biological demand due to respiration of aquatic plants and sediment loads of nutrient rich detritus in the river. Summertime high water temperatures and the growth and respiration cycles of aquatic plants are events which interact synergistically. The negative impact to water quality (and therefore to fish populations) can be much greater than either temperature or DO₂ concentration alone (Campbell 1995).

In summary, the Service agrees that water temperature and nutrients are appropriate "listed pollutants" in the CNCRWQCB's schedule for development of TMDL allocations for the mainstem Klamath River in California. The Service recognizes that water temperatures on both the Trinity and Klamath rivers at the respective trapping locations can be high enough during some summer periods to be stressful to fish populations. However, the relatively greater quantity of aquatic plant growth and nutrient rich detritus of the Klamath River, combined with warm water temperatures in the summer, have resulted in deleterious DO₂ concentrations which have directly contributed to occasional fish kills on the river and led to the consistently higher rate of fish mortalities at the Klamath trap.

Therefore, the Service strongly recommends that the CNCRWQCB consider including DO₂ as a listed pollutant in the development of TMDL allocations for the mainstem Klamath River in California. And in order to have any significance, it is imperative that during summer months when high water temperatures can be expected, measurements of DO₂ concentrations include samples taken during those hours when minimum values can be expected (e.g. 3:00am). Further, water quality sampling locations should include additional sites that include several main river channel areas that are relatively of slower relative velocity. It is in these areas that aquatic plant growth, and therefore diel fluctuations of DO₂ levels, may be significant.

If you have any questions or require additional information please contact staff biologist Jim Craig of this office at (707) 822-7201.

Sincerely,



Bruce G. Halstead
Project Leader

cc: Cindy Barry, ARL, FWS, Portland, Oregon
Steve Lewis, Project Leader, FWS, KBERO, Klamath Falls, Oregon
Ron Iverson, Project Leader, FWS, KRFWO, Yreka, California
Karl Wirkus, Area Manager, BOR, Klamath Project, Klamath Falls, Oregon
Rich Elliot, Regional Manager, CDFG, Region 1-HQ, Redding, California
Troy Fletcher, Fishery Program Director, Yurok Tribe, Klamath, California
Mike Orcutt, Natural Resources Director, Hoopa Tribe, Hoopa, California
Leaf Hillman, Director, Department of Natural Resources, Karuk Tribe of
California, Orleans, California
Don Reck, NMFS, Eureka, California

with attachments

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